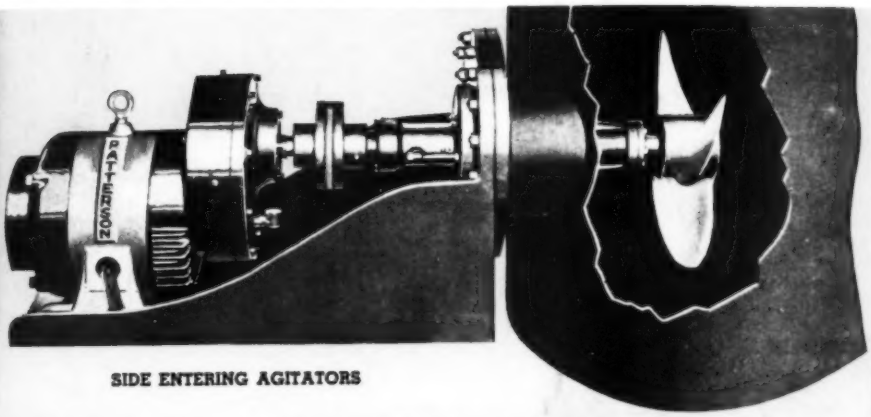
ECHNOLOGY DEPT.
PUBLIC LIBRARY

THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE — FEBRUARY. 1943



SIDE ENTERING AGITATORS

MIXER DRIVES

DOING A SUPERLATIVE WAR-TIME JOB OF PRODUCTION IN PAPER... WITH PEACE-TIME EASE and DEPENDABILITY!

PATTERSON MACHINERY

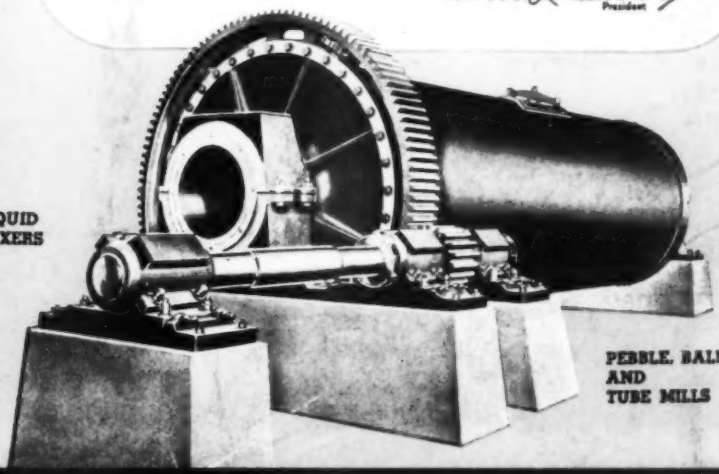
MANUFACTURERS PATTERSON MACHINERY

THE PATTERSON FOUNDRY & MACHINE CO.

EAST LIVERPOOL, OHIO, U. S. A.

Richard L. Cameron
President

LIQUID MIXERS



PEBBLE, BALL AND TUBE MILLS

Orchids for Oilcans

It is high time that great honor be paid the humble oil can!

Too often, back in those lush, pre-priority days, the oil can suffered the humiliation of serving as a prop for cobwebs.

With oil cans serving spiders instead of machines, working parts fell prey to their greatest enemy FRICTION.

For lack of oil at the proper time and place, untold years of potential machine life were lost forever.

Then WAR came. Entered the era of critical materials, priorities, allocations, and machine scarcity. Old machines became almost priceless wherever money alone could not buy new ones.

But old machines cried loudly for relief from their time-worn enemy FRICTION. So the oil can was taken away from the spiders to serve their real masters —the machines.

Yes—it took WAR to bring the humble oil can into the spotlight *where it belongs!*

All it asks is plenty of good oil and a friendly hand to press it into service.

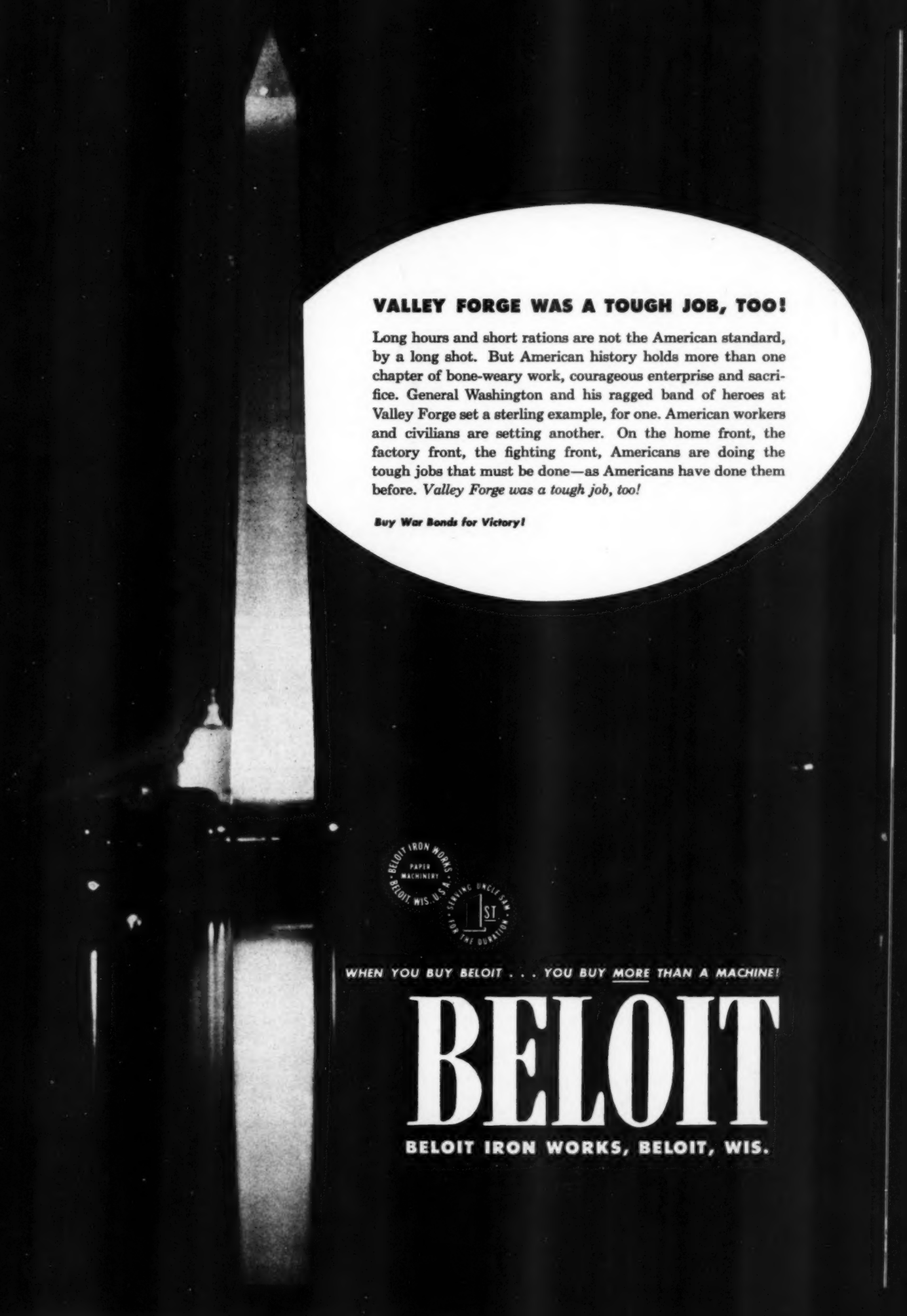
Like all machines designed for high standards of performance, Seybold Paper Cutters return dividends from proper maintenance. That's why we say "Orchids for Oil Cans."

SEYBOLD SALES AND SERVICE

NEW YORK:
E. P. LAWSON CO., INC.
426 West 33rd Street

CHICAGO:
CHAS. N. STEVENS CO., INC.
112 West Harrison Street

Southern Sales District: HARRIS-SEYBOLD-POTTER CO., 220 Luckie St., N. W. Atlanta, Ga. West Coast Distributor: HARRY W. BRINTNALL COMPANY, San Francisco, Los Angeles, Seattle Canadian Distributor: HARRIS-SEYBOLD-POTTER (CANADA) LTD., Toronto and Montreal



VALLEY FORGE WAS A TOUGH JOB, TOO!

Long hours and short rations are not the American standard, by a long shot. But American history holds more than one chapter of bone-weary work, courageous enterprise and sacrifice. General Washington and his ragged band of heroes at Valley Forge set a sterling example, for one. American workers and civilians are setting another. On the home front, the factory front, the fighting front, Americans are doing the tough jobs that must be done—as Americans have done them before. *Valley Forge was a tough job, too!*

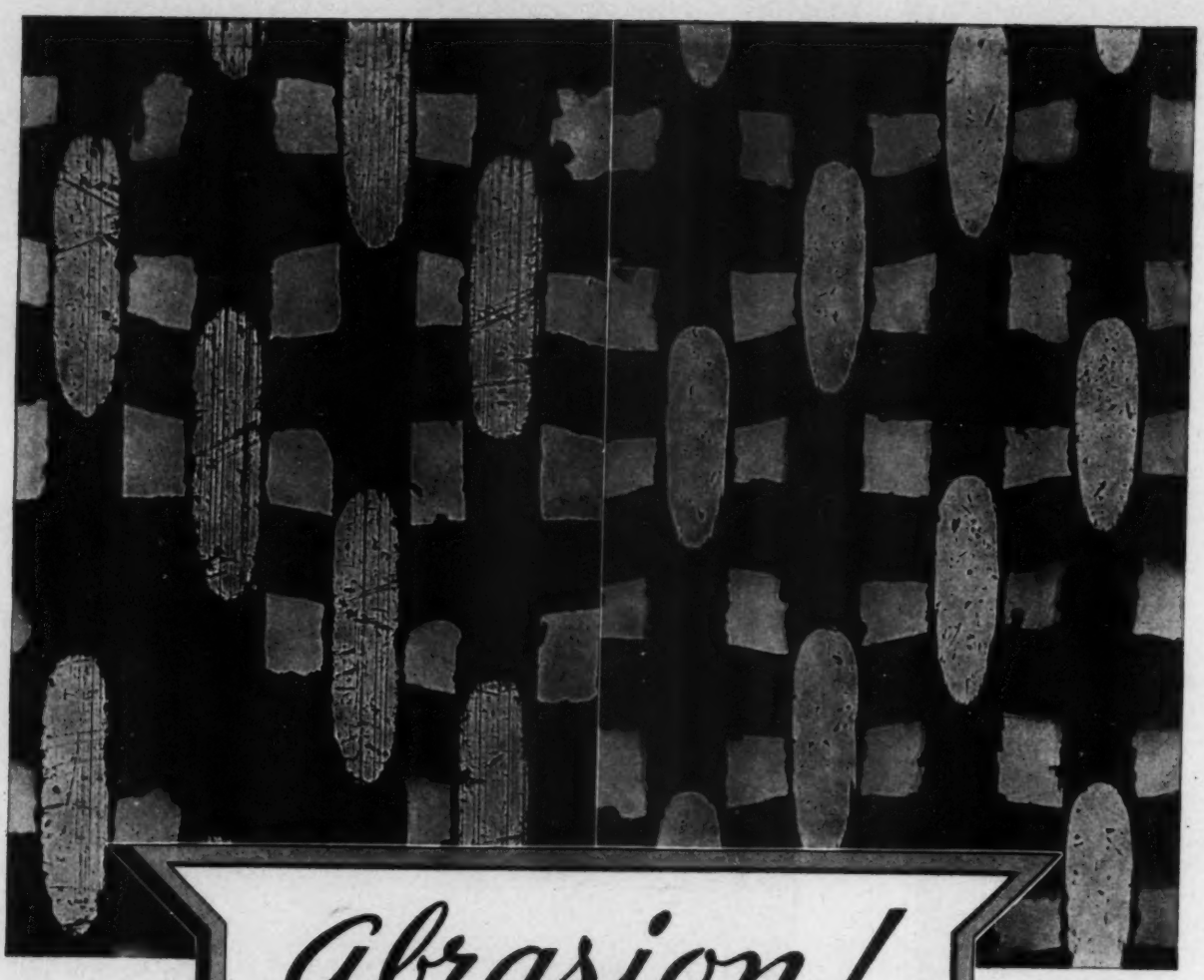
Buy War Bonds for Victory!

BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS., U.S.A. · SERVING UNCLE SAM · 1ST · FOR THE DURATION

WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE!

BELOIT

BELOIT IRON WORKS, BELOIT, WIS.



Abrasion!

FOURDRINIER WIRE'S WORST ENEMY

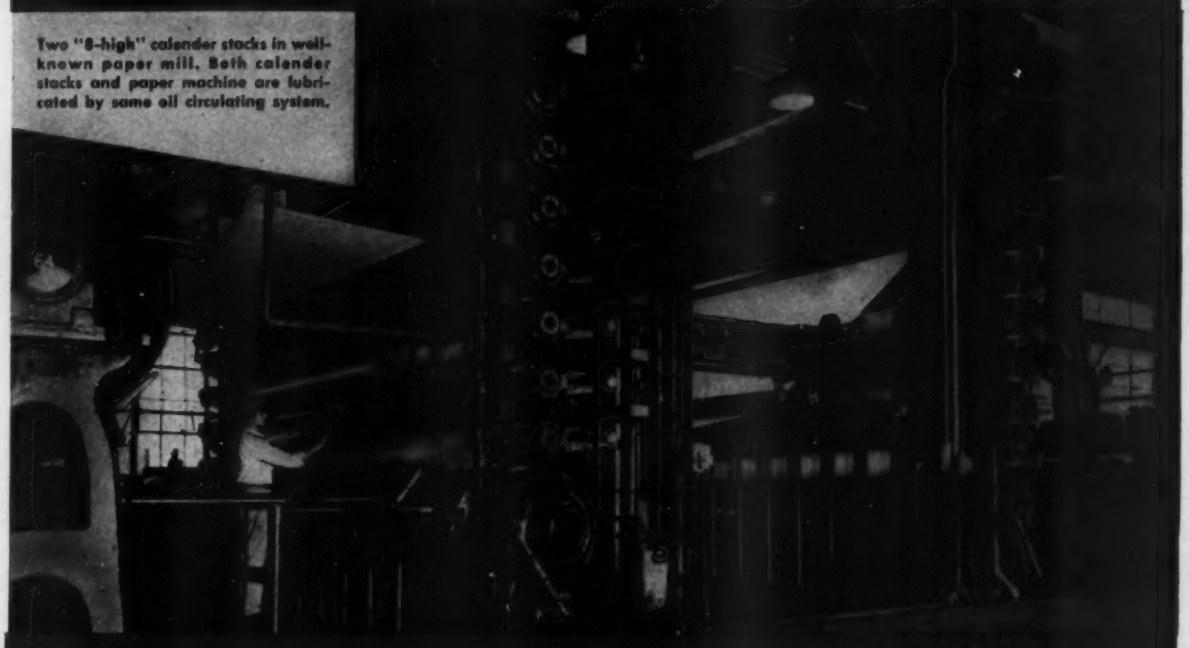
Examine these two (50x) photomicrographs of similar wires. Note the differences in wear they reveal. One shows the knuckles deeply scratched and worn long by the constant abrasive action of adverse machine conditions and furnish. The other shows much less wear as evidenced by the shorter worn surfaces and lack of scratches because running conditions were more satisfactory. Yet both wires were run simultaneously for **the same length of time** on different machines.

Check machine and stock conditions in your mill. Reduce abrasion and lengthen the life of your wires.

This is the first of a series on factors contributing to wire life.

Appleton Wire Works, Inc. Appleton, Wis.

BEARINGS *Cool*...



Two "8-high" calender stacks in well-known paper mill. Both calender stacks and paper machine are lubricated by same oil circulating system.

from Wet End to Calender Stacks

YOU can be certain of cooler-running bearings, from one end of your paper machine to the other, when they are lubricated with *Texaco Ursa Oil.*

Texaco Ursa Oil resists breakdown and sludging under high working temperatures and pressures. Its use keeps oil lines open, assuring clean, cool oil to every bearing. This oil is also uniformly easy to filter or reclaim.

The outstanding performance that has made Texaco preferred in the fields listed in the panel has made it preferred by prominent pulp and paper mills everywhere.

These Texaco users enjoy many benefits that can be yours. A Texaco Lubrication Engineer will gladly cooperate in the selection of the most suitable lubricants for your equipment... just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write to:

The Texas Company, 135 East 42nd Street, New York, N. Y.

THEY PREFER TEXACO

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

TEXACO

TEXACO Lubricants and Fuels
FOR THE PAPER INDUSTRY

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

THE CHEMICAL COMPOUND THAT OUTDID

Rip Van Winkle

• Commercially, *sodium chlorite* was asleep for 100 years. It was not until 1941 that it came into its own – when it was first produced in commercial quantities at Mathieson's new chlorite plant at Niagara Falls. Fourteen years of intensive research and practical experimentation by the Mathieson technical staff had preceded the actual construction and operation of the plant.

Long known to chemists by the formula $NaClO_2$, sodium chlorite has unusual oxidizing powers which make it an invaluable bleaching and processing agent. Today sodium chlorite is widely used in the paper and textile industries. It has successfully demonstrated its ability to bleach paper pulp and textiles to high whites without loss in tensile strength – a result that no other known processing agent has been able to achieve. Non-hygroscopic and readily soluble in water, sodium chlorite is highly stable both in solution and in solid form . . . can be heated to 150 degrees C. without decomposition.

Every day this exclusive Mathieson product is finding new applications in American industry – at a time when progress and production are as vital to victory as all-out offensives on the fighting fronts.

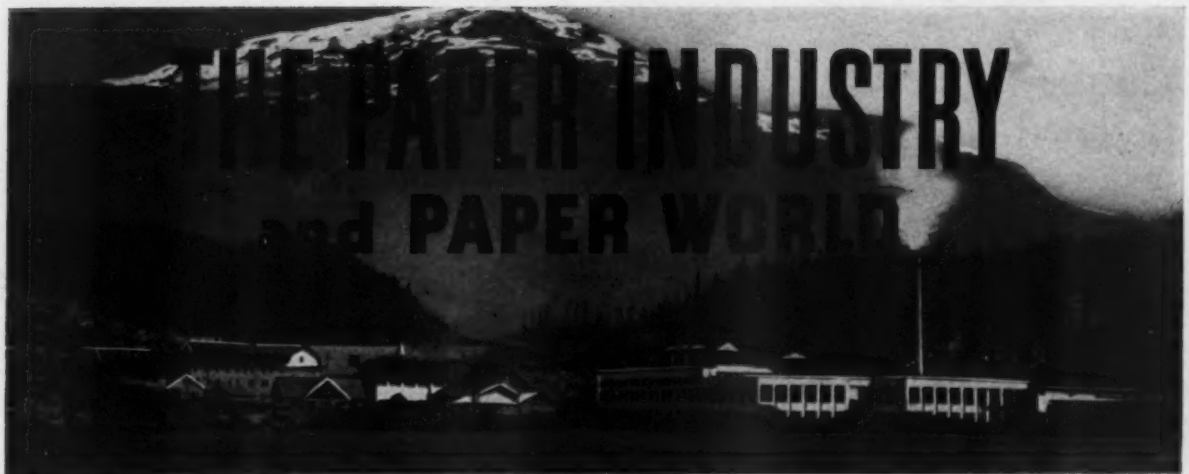
DO YOU KNOW THESE FOUR SODIUM CHLORITE PRODUCTS?

- *Textone* for textiles
- *C2* for paper pulp processing
- *Sodium Chlorite Technical* for general commercial oxidation and processing
- And, of course, the *pure analytical grade* used as a laboratory reagent

Mathieson CHEMICALS

THE MATHIESON ALKALI WORKS (INC.)
60 EAST 42ND STREET, NEW YORK, N. Y.

LIQUID CHLORINE . . . SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . SYNTHETIC SALT CAKE . . . DRY ICE . . . CARBONIC GAS . . . SODIUM CHLORITE PRODUCTS



Published monthly by

FRITZ PUBLICATIONS, INC.

59 E. Van Buren St., Chicago, Ill.

•

Member:
Audit Bureau of Circulations
Associated Business Papers, Inc.

•

EDWARD B. FRITZ
Founder

A. SCOTT DOWD
President & Gen. Mgr.

A. C. L. FRITZ
Vice Pres. & Treas.

A. C. BRUCE
Secretary

HARRY E. WESTON
Editorial Director

BESSE MERRITHEW
Editor

EDGAR C. FARREN
Production Manager

•

Entered as second class matter June 29, 1938, at the post office at Chicago, Ill., under the Act of March 3, 1879. Subscriptions in the United States, U. S. Possessions, Canada, Cuba and Mexico, $2.00 for one year or $3.00 for two years. All other countries $3.00 for one year, or $5.00 for two years.

Copyright 1943 by Fritz Publications, Inc.

THE PAPER INDUSTRY and PAPER WORLD is indexed regularly in *The Industrial Arts Index*. An index to each volume is issued annually by the publisher as Section Two of the April number.

VOLUME 24 — FEBRUARY, 1943 — NUMBER 11

—FEATURES—

Newsprint Engineering 50 Years Ago and Now.....A. H. White 1123
Pump Maintenance .....Fred D. Mosher 1126
Public Relations Looks in on the Paper Industry....Worth Colwell 1129
KVP's New Research Laboratory..... 1130
Calender Coloring .....F. O. Sundstrom 1132
Convention Papers . . . Abridged..... 1156

—NEWS—

. . . for Freedom?.....1102
Trade Winds 1103
Allied 1136
Associations 1140
Safety 1148
Names in the News.....1150
Personals 1150
Necrology 1154

—DEPARTMENTS—

Theme Page 1102
Editorials 1119
Current Thought.....1120
Paper Sketches.....1135
Coming Events 1146
Safety Contest Scores.....1148
New Equipment and Supplies.1172
Technical Developments 1176
Papermaking Patents 1178
New Publications.....1180
Current Market Quotations...1182
Index to Advertisers.....1185

ADVERTISING REPRESENTATIVES

New York
LOUIS D. SCHNABEL
9 Rockefeller Plaza
Circle 7-3085
New York, N. Y.

Cleveland
KURT R. GROENER
15910 Fernway Road
Skyline 2647
Shaker Hts., Cleveland, O.

Chicago
JOHN D. HENDERSON
59 E. Van Buren Street
Wabash 3543
Chicago, Illinois

Los Angeles
Nourse Associates, Park Central Building, 412 West 6th Street, Los Angeles, California

USEFUL CORROSION DATA*

Comparative data assumes new importance in selection of substitute materials

For many applications requiring corrosion-resistant materials, strategic alloys are no longer available. Users must therefore resort to the less restricted metals.

In this situation, the Technical Service Division of International Nickel, welcomes the opportunity to be of service.

Even though your problem may not be concerned with Nickel or its alloys, you are invited to utilize information in INCO corrosion data files.

Much of this information has been gathered by INCO Development and Research men as a result of corrosion tests carried out in various plants under actual operating conditions. It applies not only to Nickel Alloys and other corrosion-resisting materials, but also to other metals, including ordinary iron and steel.

In order to supply you with specific data on your particular problem we should know the exact conditions and circumstances involved in each case.

***A "CORROSION DATA WORKSHEET"** has been recently prepared to simplify the job. If you will request the worksheet, fill it out and return, we will gladly interpret corrosion data with respect to your individual problem. You incur no obligation. For information and assistance please address the Technical Service Division.

The International Nickel Company, Inc.

67 Wall Street, New York, N. Y.

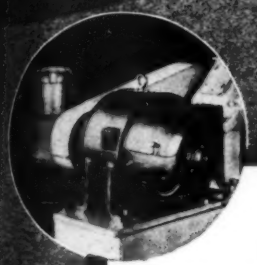
FU
4

FOR FACTORIES WITH A-C. POWER ..
A NEW PRODUCTION AID

AN ALL-ELECTRIC ADJUSTABLE-SPEED DRIVE for A-C. CIRCUITS

Speed Ranges up to 16 to 1
Sizes 1 to 30 hp.

RELIANCE VS DRIVE

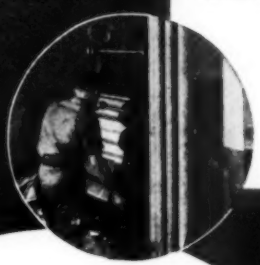


POWER

Plenty of it, applied directly without intermediate speed-changing devices.

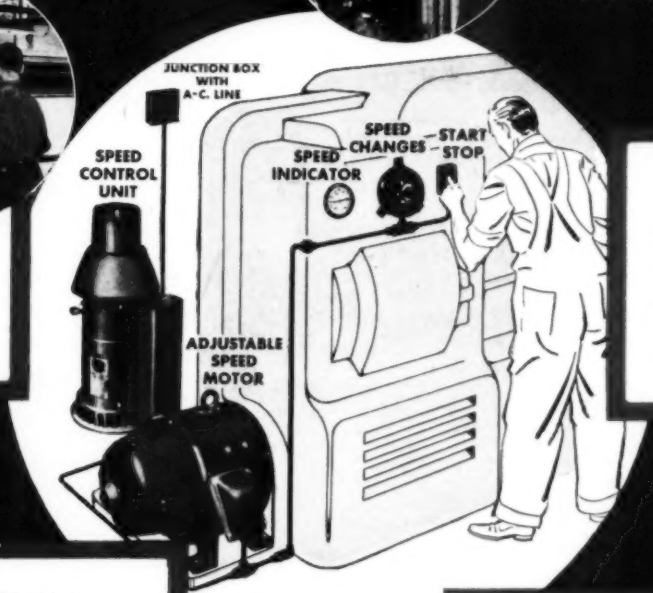
SAFE SPEEDS FOR THREADING AND INCHING

The drive can be arranged to give very slow speeds while threading material by hand or setting up work.



SPEED CHANGES

Smooth changes over ranges up to 16 to 1. Wider ranges under special conditions . . . Speeds can be adjusted while machine is in operation.



QUICK STOPPING

Obtained electrically either by operation of speed adjuster handle or *stop* button.

CONTROLLED ACCELERATION

Torque is provided to suit the job. No clutches are needed. Acceleration is smooth so that driven machine and material in process are not subjected to undue shock or strain.

SPEED SETTING

When set for a given operation the motor may be stopped and started without interfering with the speed setting.

RELIANCE ELECTRIC & ENGINEERING COMPANY
1088 Ivanhoe Road • Cleveland, Ohio

Birmingham · Boston · Buffalo · Chicago · Detroit · Greenville, S. C. · Houston, Tex. · Los Angeles · Minneapolis · New York · Philadelphia · Pittsburgh · Rock Island · St. Louis · San Francisco · Syracuse, N. Y. · and other principal cities

RELIANCE A-C D-C MOTORS

712

GENERAL COAL GOES TO WAR—

More than seven hundred of our men—miners, machinists, clerks, salesmen, engineers and executives have answered the call to serve in the armed forces. Those of us left behind gladly "Close Ranks" to *keep the coal rolling.*

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

GENERAL

Reg. U.S. Pat. Off.

RODA — High grade gas, by-product and steam coal from Wise County, Va., on the Interstate Railroad.

DENDRON — High grade gas, by-product, steam and domestic coal from Wise County, Va., on the Interstate Railroad.

STONEGA — High grade, high volatile steam and by-product coal from Wise County, Va., on the Interstate Railroad.

PREMIX — A laboratory controlled product blended to meet exacting stoker requirements. From Wise County, Va., on the Interstate Railroad.

COKE — Roda and Stonega from Wise County, Va., and Connellsville Coke from Pennsylvania.

CRITERION COAL — High grade gas, by-product, steam and domestic coal—Pittsburgh seam from Irwin Basin, Westmoreland County, Pennsylvania, on the Penna. Railroad.

CROZER — Genuine Third Vein Pocahontas from McDowell County, W. Va., on the Norfolk & Western Railroad.

Admiralty Coal — Genuine New River Smokeless, Beckley or Sewell seam from Raleigh County, W. Va., C. & O. and Virginian Railroads.

Old Kentucky — Hazard No. 4 and No. 7 steam and domestic coal from Wiscoal, Knott County, Kentucky, on the L. & N. Railroad.

GENCO — Steam and domestic coals from a number of producing districts.

ANTHRACITE — Premium and standard qualities in the entire range of Anthracite burning characteristics.

Capable engineering personnel and the experience gained through long and varied marketing activity assures proper application of one of the above brands and effective servicing of any fuel requirement.

General Coal Company

123 SOUTH BROAD STREET . . . . . PHILADELPHIA, PA.

Branches

BLUEFIELD, W. VA.
BOSTON
BUFFALO
CHARLESTON
CHARLOTTE, N. C.
CINCINNATI
DETROIT
NEW YORK
NORFOLK
PITTSBURGH

★★★ and now

STARJEL

★ FOR BEATER WORK

★ AVAILABLE FOR PROMPT SHIPMENT

★ Stein-Hall Paper Laboratories are glad to announce this latest development and recommend it as deserving your immediate investigation.

STEIN, HALL & COMPANY, INC.
285 MADISON AVENUE NEW YORK

STEIN, HALL MFG. COMPANY
2841 S. ASHLAND AVENUE CHICAGO

Founders: STEIN HALL RESEARCH FELLOWSHIP AT THE INSTITUTE OF PAPER CHEMISTRY APPLETON, WIS.

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

THIS WAS THE BEGINNING OF AN INDUSTRY

make APPLETON FELTS good paper

Surrounded by the tools of his trade, this first paper maker never thought of production. He produced only what his individual efforts could make—long since replaced by production methods so that today tons of paper are produced easier than he could make sheets. Even he used felts in his art. Felts, too, have kept pace with the progress of the industry. Today Appleton Felts are preferred by mills everywhere.

This advertisement is one of a series depicting early history of paper making.

Appleton Woolen Mills

APPLETON • WISCONSIN

PREVE

Diagnosis and preventive measures are not limited to the activities of the medico. The Betz organization has been applying these principles in the field of industrial water conditioning for many years . . . and the results obtained have borne out the soundness of a scientific approach.

Water, which can truly be called the common denominator of all industry, is seldom suitable for use in its natural state. It is our function to assume the responsibility for protecting industry from the many hazards which accompany the use of incorrectly or inadequately conditioned water for boiler, cooling, and process uses . . . and in the handling of problems of industrial waste and sewage disposal.

We have laboratories and engineers located throughout the United States and Canada.

W. H. & L. D. BETZ

FRANKFORD • PHILADELPHIA • PENNA.

CHEMICAL ENGINEERS AND CONSULTANTS ON ALL WATER PROBLEMS

What did *you* do today ...for Freedom?

Today, at the front, he died . . . Today, what did *you do?*

Next time you see a list of dead and wounded, ask yourself:

"What have *I* done today for freedom?

What can *I* do tomorrow that will save the lives of

men like this and help them win the war?"

To help you to do your share, the Government has organized the Citizens Service Corps as a part of local Defense Councils with some war task or responsibility for every man, woman and child. Probably such a Corps is already at work in your community. If not, help us start one. A free booklet available through this magazine will tell you what to do and how to do it. Get into action today, and get the satisfaction of doing a needed war job well! *EVERY CIVILIAN A FIGHTER.*

CONTRIBUTED BY THE MAGAZINE PUBLISHERS OF AMERICA

TRADE WINDS

. . Washington News . .

RESUME OF GOVT. PAPER RESTRICTIONS

▶▶▶ PANTIES FOR LAMB CHOPS are off for the duration. This is a characteristic restriction on the production of paper products issued by the War Production Board as part of orders limiting the output of paper during 1942. Bakers' specialties, such as cake circles, coasters and mats, such as beer mats, finger bowl liners, laundry specialties, such as shirt protectors and bands, novelties, such as serpentines, place cards, and artificial flowers, punch boards, and a long list of similar materials cannot be produced, presumably for the duration.

The basic order limiting paper and paperboard production fixes the year from October 1, 1941, to September 30, 1942, as the period to be taken as 100 per cent production, and newsprint and writing paper can be produced up to 90 per cent of this figure until and unless further orders fix new lower limits. Tissue paper and container board may be produced to 100 per cent of the output in the base period, while wrapping paper is limited to 85 per cent. Groundwood, book, and absorbent papers can only be produced to a total of 80 per cent of the output in the base period, and folding box, set-up box, and cardboard output is fixed at 80 per cent, though special industrial boards can be produced at a 90 per cent rate. The production rate is fixed by individual mills, which are allowed reasonable leeway in switching from one product to another. Some papers are exempted from any restriction, including sanitary napkin and wadding stock, absorbent paper for vulcanizing, and for resin impregnating and plastics, building papers and boards, container board from waste, cigarette, condenser carbonizing and stencil tissue papers, and photographic and currency paper. Original provisions of the unamended order providing for operation of one-machine mills, and other similar conditions are unchanged in the revised order. The order affecting the primary mills is to be known as Order M-241, as amended, January 8, and the order affecting paper products is General Conservation Order No. M-241-a.

1941 STATISTICS ON PULP, PAPER AND PAPERBOARD

Statistics on wood pulp, paper, and paperboard for the year 1941, collected and compiled by the Division of Current Manufactures Reports of the Bureau of the Census for the War Production Board, have recently been published.

This year two new tables of data not heretofore covered by the Census are included. These relate to wood pulp consumption, and consumption of fibrous materials other than wood pulp. Except for the new data, the statistics are on approximately the same basis as those published for earlier years by the Bureau of the Census.

▶▶▶ THERE HAS BEEN another estimate of the nation's paper requirements for 1943. The figure is now set at 14,300,000 tons, which is a material increase over some earlier predictions. This figure, however, is materially under the production which would be permitted under the new limitation orders, and the industry is being asked to co-operate in reducing output to this figure without the pressure of too many restrictive formal orders.

▶▶▶ CANADIAN PRODUCERS OF WOOD PULP shipped to the United States will be permitted to add to their price the transportation allowances which would be equivalent to those formerly allowed on Pacific coast shipments.

▶▶▶ A NEW WPB ORDER limits the number of sizes of shipping sacks, and also restricts the use of cotton for such shipments on certain classes of merchandise. The order is expected to result in saving by standardizing the number of sizes. Grocery bags are not affected.

▶▶▶ THE PAPER INDUSTRY will be affected indirectly by orders forbidding the manufacture of printing machinery for use in the United States after January 30.

▶▶▶ THE USE OF DYES AND ORGANIC PIGMENTS by the paper industry will be curtailed by an order issued January 22, retroactive to January 1. The result will be a limitation on varieties of colored paper, and the use of color in lighter shades than heretofore. The sale of such pigments is cut to 60 per cent of the 1941 consumption.

SEVERAL CHANGES IN WPB PERSONNEL

Some important changes have been made in War Production Board personnel. Ernest Kanzler, one of Donald Nelson's principal subordinates, has resigned as Director General for Operations, and John R. Kimberly, formerly Deputy Director General for Industry Divisions has been made As-

sistant Director General for Operations. Curtis Calder, who was assistant to Mr. Kimberly has been named to succeed Mr. Kanzler, and Dr. Ernest W. Reid, Chief of the Chemicals Branch of the WPB has succeeded to Mr. Kimberly's former title. Mr. Calder was at first named to succeed Mr. Kimberly with Dr. Reid as his assistant, but when Mr. Kanzler retired, he was advanced to the vacant post. His advancement from Mr. Kimberly's assistant to his superior is understood to have been made at the suggestion of Mr. Kimberly, who preferred the post he retains.

◆

▶▶▶ THE DOWNTOWN RETAIL SALES building of the Frederick Paper & Twine Company, Lima, Ohio, which was destroyed by fire December 28, will be rebuilt on the same site, it was decided by the directors of the company recently. Damage by the fire amounted to $100,000.

◆

LABORATORY FOR WOOD RESEARCH

One of the most significant moves in the program to develop new uses for wood is the establishment of a $100,000 laboratory by the Weyerhaeuser Timber Company of Longview, Washington. The building is two stories in height, of wood construction, and will be staffed by 30 persons, including a number with extensive professional training.

The company's objects in building the laboratory were threefold: protection of the present business and stabilization of employment; expansion of the present business with respect to certain type of present products; and development of new business, including more complete or efficient utilization of raw materials and discovery of new products and new production methods.

CHAMPION CO.'S OLD-TIMERS HOLD ANNUAL BANQUET

More than 150 members of the Old-Timers Club of the Champion Paper and Fibre Company, Canton, North Carolina, attended the eighth annual banquet of the organization held January 9 in the Champion Y. M. C. A. gymnasium.

J. Med Williams, assistant superintendent of the soda-sulphite department of the Canton Division of the company, was unanimously elected president for the coming year; John Whetstine, vice president; and Miss May Holtzclaw, one of the two women members of the club, secretary and treasurer. From the standpoint of continuous service, Mr. Williams is one of the oldest employees of the Canton Division.

The Old-Timers Club was organized in 1935 by Reuben B. Robertson, executive vice president of the company, to honor Champion employees who have 25 or more years of unbroken service with the company. At the present time, there are 185 members. Twenty-eight new members were received into the club at the banquet this year by Mr. Robertson, and were given the customary service emblem of the Old-Timers organization — attractive bronze watch charms bearing the trade-mark of the Champion Paper and Fibre Company.

◆

▶▶▶ AUSTRALIA IS STILL purchasing shipments of British Columbia pulp from the Powell River Company, Powell River, and the British Columbia Pulp and Paper Company, Ocean Falls. These shipments are being sent to Australia to mix with pulp produced and developed in the newsprint mills established a short time ago in the Derwent Valley, Tasmania. These mills were built under the supervision of engineers from British Columbia. Much of the experimental work in connection with the construction of the mills and in the designing of equipment was carried out in British Columbia plants, shipments of Australian wood having been sent to Canada for test runs.

◆

▶▶▶ ST. REGIS PAPER COMPANY, Tacoma, Washington, recently purchased the extensive timber interests of Ralph M. Round in the holdings of the Lake Logging Company on Vancouver Island. The amount of money involved in the transaction has not been announced; however, under the new setup it is stated that H. W. Hunter, for some time a partner with Mr. Rounds in ownership and operation of the British Columbia timber holdings, will continue to hold a minority interest in the company and direct company affairs from the Vancouver office.

◆

SALE OF ESPANOLA WILL NOT AFFECT 5% BOND PAYMENT

A further distribution to holders of Abitibi Power & Paper Company's 5 per cent bonds as a result of the sale of the company's Espanola mill to the Kalamazoo Vegetable Parchment Company, Kalamazoo, Michigan, is considered unlikely.

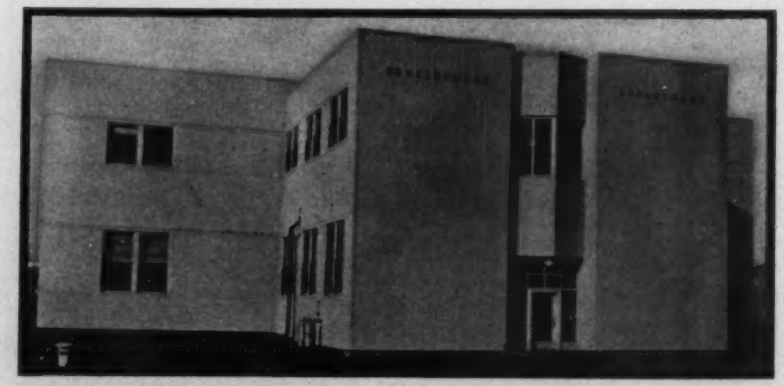
The question as to whether or not a distribution can be made will be determined by the Foreign Exchange Control Board policies, which at present, according to spokesmen for the Bondholders Protective Committee, would probably not permit any payment.

◆

▶▶▶ EMPLOYMENT OF OFFICE WORKERS at mill jobs during their spare time has been started by the American Writing Paper Corporation, Holyoke, Massachusetts, in an effort to relieve the manpower shortage. The employees get time and a half for overtime at the regular rate for the kind of mill work they do. Under this system one office department head went to work unloading freight cars at laborer's pay. About a dozen employees volunteered for mill work of various kinds in beater rooms and around the paper machines.

◆

▶▶▶ OFFICE STORAGE FILES of strong corrugated paper are now being manufactured by the Hinde & Dausch Paper Company, Sandusky, Ohio, because of steel priorities and the growing shortage of hardwoods.



Weyerhaeuser Development Laboratory at Longview, Wash.

PAPER · · · America's 6th Industry

BULL'S EYE AGAIN! . . .

(NEWS ITEM: *Army officers estimate that the average raw recruit requires eight to ten weeks of basic training before he is allowed to fire a gun.*)

It takes target paper—lots of it—to make an expert rifleman. Long hours on the firing range . . . weeks of patient practice—these are necessary preliminaries before a man can take his place in a tough, experienced combat unit.

In one week the War Department included in its announcement of contracts $79,904,00 for target paper. The production of target paper is only one small part of the contribution of Paper to the war effort. But, it takes "Bull's Eyes" on the target range to score "Bull's Eyes" on the battlefield.

The many added war uses for paper and paperboard have increased the responsibilities of the Pulp and Paper Industry. Any let-down in quality of production is a threat to our "all-out for Victory."

The Puseyjones Flow-Spreader has answered the problem of delivering stock of uniform formation to the fourdrinier or cylinder wet end. The entire flow comes from one pipe and is spread smoothly and evenly across the machine by a simplified nozzle construction. The result is higher speeds, lower furnish costs, and improved finish.

Puseyjones men and production facilities are on war work. In the meantime, we are doing our best to supply replacement parts to keep present equipment operating efficiently.

Write for folder, "The Post-War Fourdrinier."

All orders subject to priority conditions of War Production Board.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Wilmington, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

J. R. BOOTH, LTD. STARTS A PLAN TO RE-USE BAND IRON

A unique and efficient conservation plan has been inaugurated by J. R. Booth Limited, Ottawa, Canada. Because steel strapping plays such an essential part in packaging for safe transportation, this company worked out a plan to conserve band iron. Due to necessary wartime restrictions on the use of all metals, it has become increasingly difficult to obtain band iron.

With the full co-operation of its consignees, who regularly receive paper products packed on skids, or in bales, the company undertook to salvage band iron and have it returned to the mill. There, it is sorted, reconditioned, and used in place of new steel on succeeding shipments. The report is that this procedure has worked out very satisfactorily.

In order to encourage and assist in the reclamation of this strategic material, the J. R. Booth Company compiled illustrated memorandum sheets illustrating simple methods of coiling as well as the results of haphazard handling and coiling. The accompanying illustrations show a simple method of coiling which will save time and conserve valuable space in shipping. The company suggested that because shipping space is of such vital importance, coils should be made of varying diameter so that one coil can be placed inside the other, thereby making a compact package. Unless properly prepared, the returned strapping may require excessive shipping space and may even be in such condition as to make reconditioning impossible.

◆

▶▶▶ SCHROON RIVER Pulp and Paper Company, manufacturers at Warrensburg, New York, since 1901, has filed a voluntary petition of bankruptcy in United States Court at Utica, New York, with liabilities of $497,965 and assets of $32,000 in real estate, plant, and equipment. Machinery is valued at $10,000 and real estate at $25,000.

◆

▶▶▶ THE FORESTRY MEMORIAL SCHOLARSHIP was awarded recently to Kenneth William Hearnden, a first year student in the Faculty of Forestry, University of Toronto. Dr. C. D. Howe, Dean Emeritus of the Faculty of Forestry, presented the scholarship, amounting to $250, at a general meeting of the students held in Hart House. This scholarship was founded last year by contributions from the alumni of the Faculty of Forestry, other interested people, and is in honor of former members of the staff and in memory of graduates and undergraduates who have lost their lives in war activities or in civilian pursuits.

STEP 1 (left) shows cutting the band iron at the joint, thereby saving as much usable iron as possible. STEP 2 (center) shows how to coil the band iron. First a loop is made and the end secured by gummed tape; then the remainder can be coiled readily. STEP 3 (right) Here the finished coil is shown with another piece of gummed tape securing the second end. The coil is now ready for shipment.

◆

COURSE IN LAB. TECHNOLOGY AT ST. REGIS CO.

A course in laboratory technology was started January 26 at St. Regis Paper Company, Deferiet, New York. This is an ESMWT course sponsored by the Federal Government and given under direction of Clarkson College of Technology, with Chase Mather, chief chemist of the mill, as instructor.

The course, stressing training in fundamentals of pulp and paper technique for testing, is primarily for the training of women to take the place of men in the paper industry; however, men are welcome to attend in the class as well.

◆

▶▶▶ A PENSION PLAN for all workers who have been with the company five years or more has been inaugurated recently by Peter J. Schweitzer, Inc., plants in New Jersey and Pennsylvania. The company assumes the cost of administering the plan, which entails the investment of 5 per cent of the employees' earnings in annuities.

◆

▶▶▶ THE MULTIWALL SANDBAG, a new sandbag with five layers of walls, for use by the Army, Navy, and civilian defense, is now being produced in large quantities by the Jaite Paper Bag Company, of Wilmington, California. The new bag, which will last for three years, is made of an asphalt laminated sheet to prevent moist sand from destroying the bag from within, three walls of natural kraft paper for strength, and an outside wall coated with waterproof resistant material to withstand severest weather conditions.

◆

▶▶▶ WORK ON THE NEW sulphite plant of the Powell River Company, Powell River, British Columbia, has been practically completed. The new unit, under construction for the past sixteen months, is believed to be one of the most modern sulphite mills on the continent. Construction was carried out under special permit from the Canadian Government.

◆

FRT. ALLOWANCES ON WOOD PULP IN CANADA & U. S. A.

Canadian wood pulp producers have been extended by the OPA the same treatment with respect to transportation allowances that applies to United States producers for sales in the United States. The amendment to the wood pulp price ceiling, effective January 12, enables Canadian producers to pass on to buyers freight costs in excess of specified transportation allowances; however, in most cases the action will result in no increase of costs to wood pulp consumers in the United States, as in the majority of cases the actual freight charges will not exceed the allowances to be absorbed by the producers in Canada.

In most cases where increases do occur, OPA estimates that total costs would be comparable to the costs of

Establishing...

PLIABILITY IN PAPER

with Trouble-Free Specialty Products

New developments improve creasing...scoring...folding... and crimping of paper and paper board

WAX IN ROSIN SIZES SOLVES IMPORTANT PROBLEM. To economically attain improved pliability without sacrificing other essential characteristics such as water resistance and strength is partially a matter of determining upon a suitable sizing formula. Since rosin size alone will tend to stiffen paper, the addition of a satisfactory modifying ingredient to the sizing formula is often made. A wax size in proper proportion, Cyanamid paper technicians have found, will solve the problem nicely. Cyanamid will be glad to assist you to determine the proper grade and percentage of wax size required in relation to the particular paper and methods of mill operation.

SIZING KRAFT PULP FOR PLIABILITY

The use of wax size usually not exceeding .2% based on the dry weight of the fiber, thereby increasing the pliability of kraft pulp paper, has been a factor in the increasing use of kraft pulp throughout the industry. Details and recommendations may be obtained by addressing Cyanamid.

FLEXIBILITY VS. RELATIVE HUMIDITY

Wax sizes offset the tendencies of paper to crack and break due to loss in moisture content. This is a particularly important advantage in cold weather when indoor humidities are likely to be low.

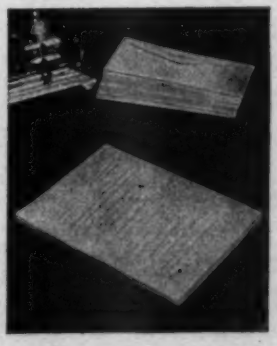
Developing the means and methods to improve the manufacture and broaden the usefulness of paper and paper products is the service that Cyanamid paper technicians, field men of broad practical experience, extend to the paper industry. Backed by Cyanamid laboratory research and development these men are available for consultation on any problem involving use of paper chemicals.

If you have a technical problem concerning flexibility — or any other subject related to the use of chemicals — feel free to call on us for further information. It involves no obligation.

Wax size used in conjunction with rosin size keeps raw stock flexible so that it will handle well on the festoons of the coating machine and in the printing to follow.

Hanging papers will exhibit high water resistance and flexibility to conform to corners and other contours when one of the newer wax sizes is used with the rosin size during manufacture.

Use of wax in sizes makes writing surfaces more resistant to pen and ink. Wax sizes are particularly applicable to envelope papers that should fold without flat surfaces or cracks.



Box boards and die pressed products handle and shape to the die more readily by the use of wax as a plasticiser in the sizing operation. A flexible size also protects the water resistance of the paper board at folded edges and corners.

WAX SIZES • COATING MATERIALS
ROSIN SIZES • SYNTHETIC RESINS
CASEIN • ALUM • CORN STARCH
TAPIOCA FLOUR • SULPHONATED
OILS • FILLERS • DEFOAMERS
AEROSOL* WETTING AGENTS
and OTHER PAPER CHEMICALS

*Reg. U. S. Pat. Off.

American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

DISTRICT OFFICES: 89 Broad Street, Boston, Mass.; 600 South Delaware Avenue, Philadelphia, Pa.; Russell & Bayard Streets, Baltimore, Maryland; Wilkinson Boulevard, Charlotte, N. C.; 860 Leader Building, Cleveland, Ohio; 20 North Wacker Drive, Chicago, Ill.; Miller Road, Kalamazoo, Michigan

eastbound shipments from the West Coast, which now have been cut off by order of the WPB. The allowances will permit Canadian shippers to continue shipments to their United States customers regardless of the greater distances to which pulp now must be shipped because of WPB allocation.

◆

U. S. CONCLUDES TRADE AGREEMENT WITH MEXICO

A Reciprocal Trade Agreement has been concluded with Mexico, effective January 30, 1943, according to the Import Committee of the American Paper Industry. No duties on incoming merchandise affecting the United States were changed, but a series of Mexican tariff items involving paper were bound, Mexico pledging itself not to increase the existing rates during the life of the agreement. The duties on fiber insulation boards and wall boards, certain types of paper of the natural color of the pulp, and those on sanitary paper, paper towels and cleansing duties were all bound at existing rates.

The President has also issued a formal proclamation putting the Reciprocal Trade Agreement with Uruguay into effect. The only item in this agreement affecting the paper industry is the confirmation, as far as Uruguay is concerned, of the new duty rate on casein which was reduced in the Argentine agreement.

◆

▶▶▶ WISCONSIN PAPER GROUP held its annual meeting January 18 at the Valley Inn, Neenah, Wisconsin. Election of officers was held, and E. H. Jennings was elected president; A. J. Schierl, vice president; L. O. Schubart, secretary-treasurer; and Irwin Pearson, executive secretary. This group is a non-profit organization which provides scheduled pool carload freight delivery service to customers of Wisconsin paper manufacturers and converters.

◆

PULP IMPORTS FROM CANADA UNDER QUESTION

Customs officials are conducting an investigation into the uses of certain material imported from Canada which may be either pulp board in rolls or pulp. The question has gone before the Bureau of Customs at Washington, and information as to the use of such material has been requested from the Import Committee. Interested mills are being circularized by the Import Committee in an effort to determine the proper classification of such material.

The specific issue arose in the case of a shipment of rolls of 14-point material which was unsized. Some Customs officials believe that the fact that the material is not sized entitles it to admission duty free as pulp, while other officials believe that the sizing is not the proper basis for differentiation. The Import Committee is asking interested mills to state whether such material was known as pulp or as pulp board at the time of the passage of the Tariff Act of 1930. If known as pulp board the Customs officials are anxious to know by what name the product was customarily known at that time. The Import Committee has always taken the position that it had no concern with the importation of pulp, a duty free commodity, but has also taken the position that it should protect domestic paper and board manufacturers against the duty free importation as pulp of material to be used as either paper or paperboard.

◆

FINANCIAL

▶▶▶ A STRONGER DEMAND for securities resulted in an almost universal increase in value for paper mill stocks and bonds during the month of January. Not only were prices better, but the more optimistic sentiment in industry resulted in materially heavier dealings in all securities.

Bedford Pulp & Paper Company—Net income for 1942 to September 30 was $65,402 as against $157,894 for the same period in the previous year.

Celotex Corporation—Net profit for the year to October 31 was $1,123,967 compared with $1,749,098 for the preceding fiscal year.

Container Corporation of America—Board of Directors of this company declared a dividend of $.25 per share payable February 20, 1943, to stockholders of record February 5, 1943.

Masonite Corporation—Net profit for the quarter ending November 30 was $346,594, equivalent to 57 cents per common share, though current dividends have been at the rate of 20 cents.

Nekoosa-Edwards Paper Company—Net profit for nine months ending September 30 was $323,669 as against $472,165 for the same period in 1941.

West Virginia Pulp & Paper Company—Net profit for the fiscal year ending October 31 was $2,589,248 as compared with $4,270,312 for the preceding year.

New York Stock Exchange—Stocks

	Closing Prices Jan. 25, 1943	Dec. 31, 1942
A. P. W. Paper Co.	*1⅜–1¾	1⅜
Celotex	9⅞	8⅜
Same Preferred	81½	75½
Certain-teed	3⅜	2¾
Same Preferred	38½	31½
Champion P. & F. Co.	18⅜	17¾
Same Preferred	100	100
Container Corp.	18¼	16¼
Cont. Diamond	8½	6¾
Crown Zellerbach	12	11⅛
Same Preferred	85	*81–84
Dixie Vortex	10¾	9¾
Same "A"	*39–39½	39
Robert Gair	2	1⅜
Same Preferred	10	9
Gaylord Container	*10½–10¾	9¼
Same Preferred	*51–54	*51–54
International Paper	9¾	8⅛
Same Preferred	54	45⅜
Kimberly Clark	26¼	*25–26
MacAndrews & Forbes	*21½–22	20
Masonite	32¾	33¾
Mead Corp.	7¼	6
Same Preferred	71¼	*66–69
Paraffine Cos.	*35–36	36⅜
Same Preferred	100	*94–100
Rayonier	12½	12
Same Preferred	*28½–29¼	26½
Scott Paper	39⅞	38
Same 4½% Pfd.	*113½–114¼	*113½–114
Same 4% Pfd.	*107¾–108½	*106–110
Sutherland Paper	27⅜	26⅛
Union Bag & Paper	9¼	7⅞
U. S. Gypsum	61½	61
Same Preferred	*172–175	*173–174½

New York Stock Exchange—Bonds

Abitibi 5%	.....	50
Celotex 4½%	100¼	99
Certain-teed 5½%	95⅜	93
Champion P. & F. Co. 4¾%	.....	104
Inter. Paper 5%	.....	102¾
Same 6%	.....	105½

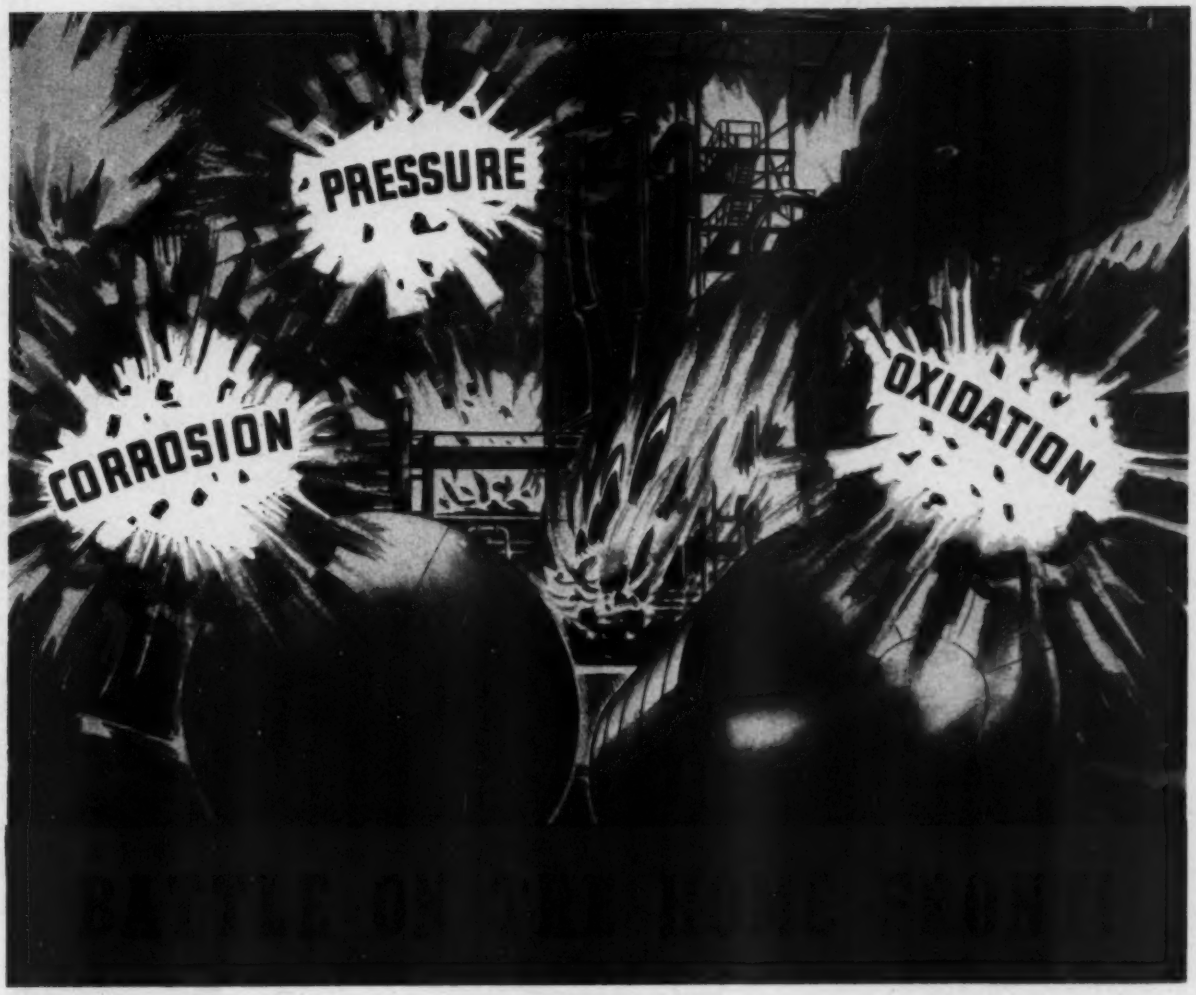
New York Curb Exchange—Stocks

Am. Boxboard	.....	4⅜
Great Northern	31	25¾
Hummel-Ross	.....	3¼
St. Regis	1⅞	1½
Taggart	.....	3¾
United Wall Paper	1⅜	1⅜

*Closing Bid and Asked Prices

◆

▶▶▶ THE MIDVALE PAPER BOARD COMPANY, Inc., has purchased from the Windsor Paper Mills, Inc., Bogota, New Jersey, its property located at Walloomsac, Town of Hoosick, New York. The price given was $112,000. This property was originally conducted as the Walloomsac Paper Company and later became the Stevens & Thompson Company. The latter company disposed of its holdings to the Windsor Paper Mills, Inc.



Corrosion, oxidation and pressure are your worst enemies. Lick these on the home front without waste of time and materials and you contribute largely to the early defeat of the Axis.

DM seamless steel tubes are designed for creep strength and pressure resistance at moderate cost.

SICROMO seamless steel tubes are popular wherever operating conditions specifically call for high resistance to oxidation and corrosion. The Timken Roller Bearing Company, Canton, Ohio. Steel and Tube Division.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

SEAMLESS STEEL TUBES

FOR AN EARLY VICTORY

Conserve critical metals by using Timken *Intermediate* Seamless Steel Tubing. It will stand the gaff of stiff post-war competition, too.

This Simple Test Shows the *Importance* of the CONCAVE SIDE!

432

You can see for yourself why belts built with the Concave side should be used in *your* plant if you will just pick up any straight-sided V-Belt and bend it as it bends in going around its pulley. As the belt bends, grip its sides as shown in the large photograph above. You will feel those sides *change shape*. The top of the belt, being under tension, narrows. The bottom, under compression, widens. The sides bulge out—as shown in Figure 1 (above, right).

Now bend a V-Belt that is built with the patented Concave side. The same shape-change takes place—but it merely *straightens* the precisely engineered Concave side, as shown in Figure 2. This belt, when bent, exactly fits its sheave groove. Two savings result. FIRST:—there is no out-bulge—therefore the entire side of the belt wears evenly and this means *longer life*. SECOND:—The entire side of the belt uniformly grips the sheave-groove wall. This carries heavier loads without slippage—a saving in belts for you, a saving in rubber for the nation.

Only belts built by Gates are built with the Concave side, a Gates patent.

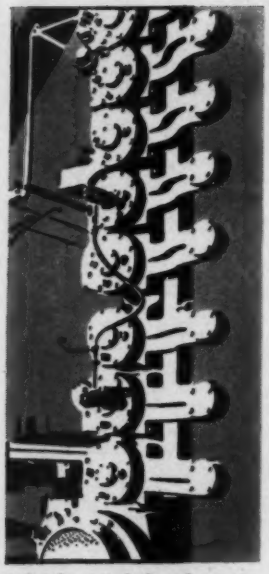
THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

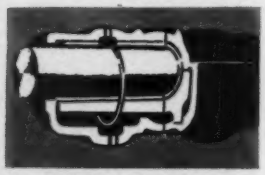
GATES VULCO ROPE DRIVES

CHICAGO, ILL. 549 West Washington
NEW YORK CITY 215-219 Fourth Avenue
ATLANTA, GA. 738 C. & S. National Bank Building
LOS ANGELES, CAL. 2240 East Washington Boulevard
DENVER, COLO. 999 South Broadway
DALLAS, TEXAS 2213 Griffin Street
PORTLAND, ORE. 333 N. W. 5th Avenue
SAN FRANCISCO, CAL. 1090 Bryant Street

Save Manpower and Materials



Calender stack bearings are subjected to high pressures and heat. The high viscosity index of Stanoil—its resistance to viscosity changes with changes in operating temperatures—makes it ideal for this lubricating job.



Ring-oiled bearings frequently operate in low temperatures where oil fails to flow at starting. The low pour test and high viscosity index of Stanoil assure adequate lubrication at both starting and operating temperatures.

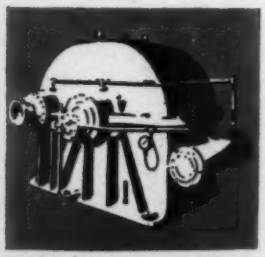
Take less time out for cleaning systems and changing oil

• Figure the man-hours of labor required to clean and change the oil in a circulating system, the bearing wells on a calender stack, or the gear case on a speed reducer. Multiply this by the number of pieces of such equipment in your mill. You'll find the lost time well worth trying to save.

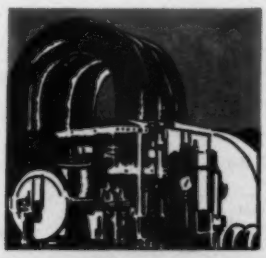
Here's what you do. Test Stanoil in just one of these units. Pick one of the harder jobs to lubricate—one that needs oil changing frequently. See if you don't get the same results as in many other plants where the stability of Stanoil has cut oil replacements one-half to one-third and even more on the tougher jobs. It has entirely eliminated cleaning on some systems.

You pick the job. A Standard Lubrication Engineer will recommend the grade of Stanoil needed. It won't be long before you'll notice how Stanoil keeps its color and reduces deposits. You'll find, too, that equipment lasts longer with this cleaner operation. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois, for an Engineer to help you make this test.

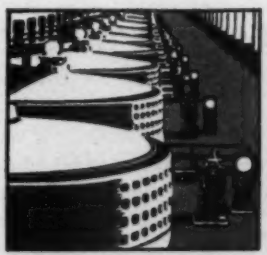
Oil is ammunition . . . Use it wisely



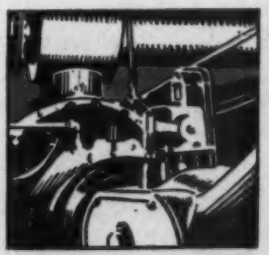
Speed reducers subject oil to agitation in the presence of air and, frequently, high temperatures, which promote oil oxidation and deposit formations. Stanoil resists oxidation even under these severe conditions.



Steam turbines represent severe service because of moisture and heat. Stanoil, because of its stability and good demulsibility, will give long service before changing is necessary, with less deposits in filters and coolers.



Hydraulic turbines ordinarily require a number of oils of various viscosities. Stanoil's high viscosity index makes it a multi-purpose oil. One grade will meet the low starting temperatures and high operating temperatures on these turbines.



Air compressors operate with fewer gummy deposits on pistons, rings, and valves, as well as less carbon, with Stanoil. Low oil consumption may be expected with freer ring action. Compressors operate longer between cleaning periods.

STANDARD OIL COMPANY (INDIANA)

★ LUBRICATION ENGINEERING

Modern technology works wonders. No doubt about that. It converts coal tar into flavoring extracts, dye stuffs, medicines. Glass into textiles. Petroleum into rubber. But it has not solved the problem of making silk purses of sows' ears or of making good paper of poor furnish. The furnish, however, is only part of the answer. Given the right kind of furnish for a specified kind of paper, the paper manufacturer must also use the right kind of felt.

Hamilton Felts, for example, differ according to the different kinds of paper that are to be formed upon them. They are alike in only one respect — *quality*, always the best for the purpose for which they are designed. But for every type of paper there is a corresponding type of Hamilton Felt. The fleeces are selected and blended with this object in view. The yarns are woven according to the same considerations. Shrinking, fulling and finishing are governed by the same principles — to make the best possible felt for every specialized paper manufacturing process.

Tell us what kind of paper product you wish to make and the manufacturing conditions in your mill. We will see that you get a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

EVERY GRAVER WATER CONDITIONING JOB *Starts Here*

THE chemical content of water varies greatly in different localities, as do the purposes for which the water is used. For that reason your water conditioning problems, whatever they are, cannot be properly solved without a careful analysis of your water supply and a thorough study of your processes.

Every installation of Graver Water Conditioning Equipment starts in the Graver laboratories. Graver chemists analyze samples of the water to be treated and Graver engineers make a detailed study of the conditions and requirements. Based on the information thus gained, the equipment is designed and built to meet the specific requirements of the job at hand.

This has been the Graver policy throughout their more than thirty years of designing and building water conditioning equipment of all types. When you specify Graver Water Conditioning Equipment you are assured of a job that is planned, designed, and built to meet your individual needs with the greatest efficiency and economy.

Consult Graver—today.
There's no obligation.

GRAVER

GRAVER TANK & MFG CO. INC.

NEW YORK
CATASAUQUA, PA

4809-59 Tod Ave.
EAST CHICAGO, IND
CABLE ADDRESS — GRAYANK

CHICAGO
TULSA

42-57-W

OVER 3,000,000,000 ENVELOPES ALONE REQUIRED ANNUALLY by the GOVERNMENT in the WAR EFFORT

Millions upon millions of letters, forms, telegrams, and other messages in envelopes are carrying America's answer to the Axis. Communication . . . by the armed forces . . . to war equipment manufacturers, registrants, . . . taxpayers, defense workers, ration boards, and to Government divisions everywhere . . . is vitally essential in the successful organization and conduct of the war program.

Millions upon millions of more envelopes are used by war industries in their voluminous business transactions.

And "communication" is only one example whereby the importance of Paper is emphasized as an essential to winning the war. For paper weaves itself through almost every phase of the struggle for victory . . . truly the lifeline in the battle for freedom . . . abroad and at home.

PAPER IS VITAL for VICTORY

Jones

E. D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of Quality Machinery for Paper Mills

Industrial Truck Care Pays You Dividends

A. E. DOROD

ASSISTANT CHIEF ENGINEER, BAKER INDUSTRIAL TRUCK DIVISION, THE BAKER-RAULANG CO.

BAKER HELPS PAPER MILLS TO "*KEEP 'EM RUNNING*" IN WARTIME

"The investment in regular inspection and lubrication of your industrial trucks is one of the best you can make." This statement from an article appearing in recent trade publications, written by a Baker engineer, is more true today than ever before. Truck maintenance is especially important in the Paper industries, where the volume of material handling has greatly increased and new equipment is difficult to get. Trucks now in service must be kept running at top efficiency . . . So that the essential points of truck maintenance may be made available to everyone concerned with their operation, reprints of this article are offered in bulletin form.

Do You Know

That many possible causes of excessive wear or loss of power are not apparent in ordinary running but can be determined only by inspection?

Do You Know

That over-lubrication can often be as harmful as under-lubrication?

Do You Know

That it is desirable to blow the dust and dirt off the truck daily before oiling?

Do You Know

That overloading a truck is helping the Axis by breaking down irreplaceable equipment?

Do You Know

That service brakes should be tested for stopping with the heaviest load to be carried, and parking brakes for holding maximum load on steepest incline truck must negotiate?

These are a few of many points covered in the Baker bulletin "Industrial Truck Care." Write for your copy or copies today.

BAKER INDUSTRIAL TRUCK DIVISION

of The Baker-Raulang Company

2169 West 25th Street • Cleveland, Ohio

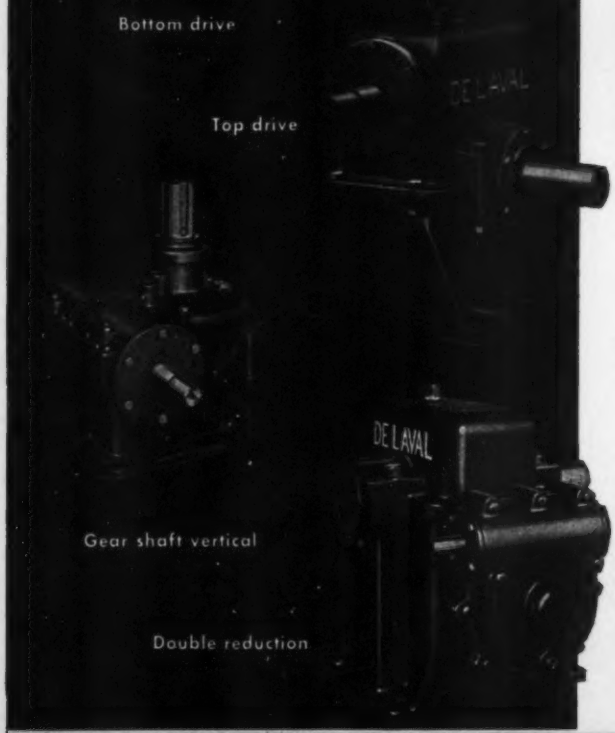
In Canada: Railway and Power Engineering Corporation, Ltd.

2900-1-43

Baker INDUSTRIAL TRUCKS

for CONTINUOUS PRODUCTION

De Laval worm gear driving coal conveyor



Breakdowns in power transmission in 24-hour plants are eliminated where plant engineers specify the

DE LAVAL WORM GEAR

for heavy duty drives, particularly in locations involving exposure to grit, dust and moisture.

The two moving parts of the gear run in a bath of oil and it is self-lubricating, requiring no attention beyond inspection of the level in the oil well at long intervals.

The unit does not throw grease or oil.

Safety guards are unnecessary, as the working parts are enclosed.

The efficiency is high, and improves with use.

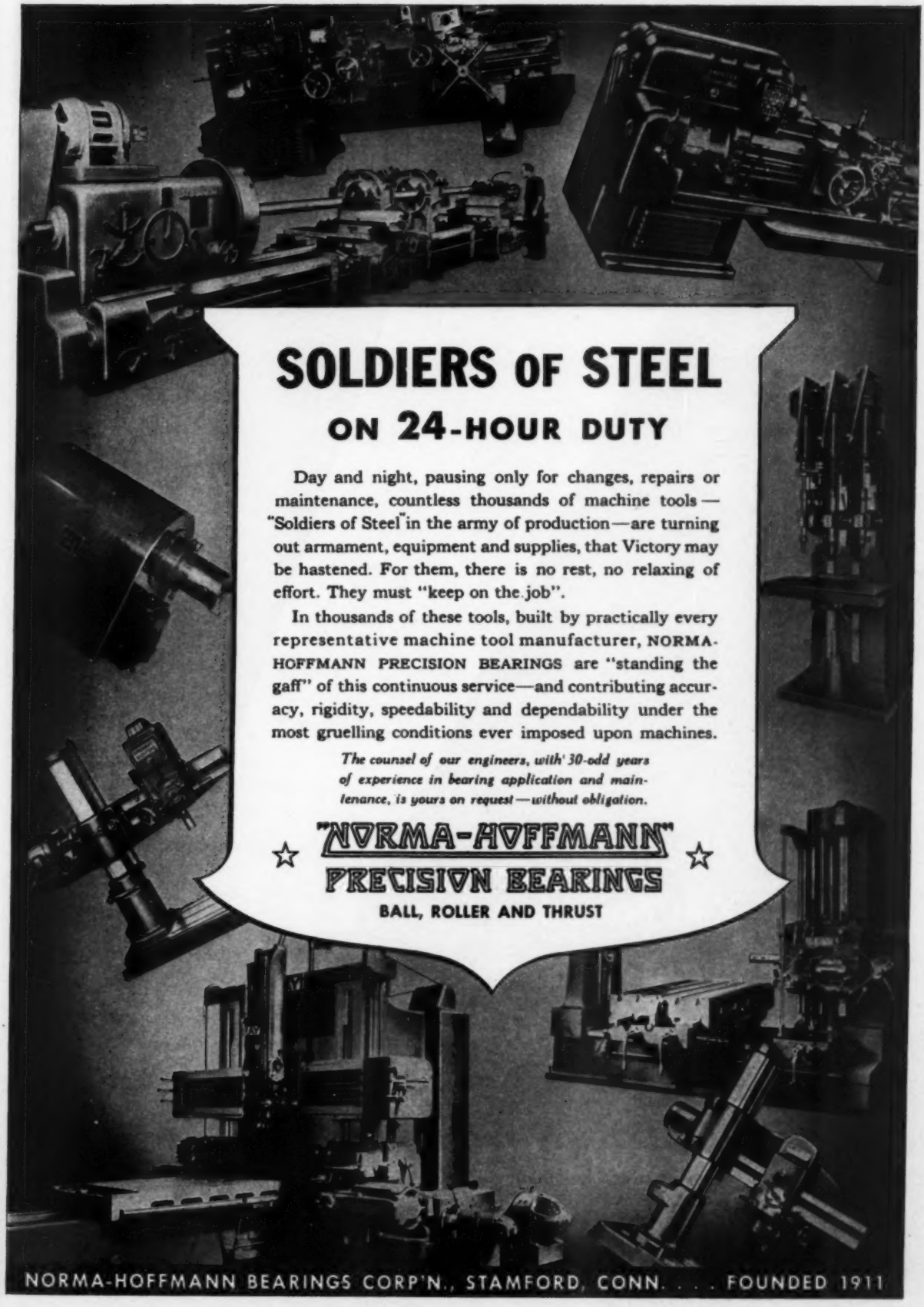
The drive is smooth and quiet. It is also positive; there is no slippage, regardless of starting torque.

Describe conditions and ask for Publication W-1132.

DE LAVAL WORM GEAR DIVISION

of the De Laval Steam Turbine Co., Trenton, N. J.

MANUFACTURERS OF TURBINES · STEAM HYDRAULIC PUMPS · CENTRIFUGAL PROPELLER ROTARY DISPLACEMENT · MOTOR MOUNTED · MIXED FLOW · CLOGLESS · SELF PRIMING CENTRIFUGAL BLOWERS and COMPRESSORS · GEARS · WORM, HELICAL and FLEXIBLE COUPLINGS



SOLDIERS OF STEEL

ON 24-HOUR DUTY

Day and night, pausing only for changes, repairs or maintenance, countless thousands of machine tools — "Soldiers of Steel" in the army of production — are turning out armament, equipment and supplies, that Victory may be hastened. For them, there is no rest, no relaxing of effort. They must "keep on the job".

In thousands of these tools, built by practically every representative machine tool manufacturer, NORMA-HOFFMANN PRECISION BEARINGS are "standing the gaff" of this continuous service—and contributing accuracy, rigidity, speedability and dependability under the most gruelling conditions ever imposed upon machines.

The counsel of our engineers, with 30-odd years of experience in bearing application and maintenance, is yours on request—without obligation.

☆ "NORMA-HOFFMANN" ☆

PRECISION BEARINGS

BALL, ROLLER AND THRUST

NORMA-HOFFMANN BEARINGS CORP'N., STAMFORD, CONN. . . . FOUNDED 1911

MERFENELOPE
Slime Chaser

In a one-ounce sealed envelope. Throw it in the beater unopened

Cleans Pipes
Kills Bacteria
Reduces Washups
Fewer Slime Rejects

R. T. VANDERBILT CO., INC.
230 Park Avenue, New York City

Editorial

Maintain Sales at Ceiling Prices

▸▸▸ STUDIES AND SURVEYS of the operations of the paper industry for 1942 under the direction and orders of the various divisions of the War Board are now in order and actively under way.

In general, the record made by the paper industry in co-operation and compliance with the War Board's orders has been excellent and the industry has shown a most commendable spirit of compliance in its all-out efforts to co-operate and win the War. However, there are exceptions where the full compliance has not been as gratifying as it should have been.

The one of importance which comes to our mind now is the failure of some mills to obtain the full ceiling prices for their products as set up in the OPA schedules.

However, we believe this failure to obtain full prices has not been the result of a wilful disregard of the OPA schedules, but rather is the result of a long-time customary practice among the paper mills of making their own prices; also, because of the failure of the OPA officials to get closer contact and co-operation with the best industry brains before the ceiling prices were promulgated; another factor, also, was the widespread conviction that the ceiling prices were to be considered only as the maximum prices and, therefore, each mill was permitted to name any price it chose to accept under the OPA set ceilings.

The result was but natural. The OPA ceilings have not been violated upward, but there has been a continuance of the cut-pricing practices current in the industry before the advent of the War.

Then, various mills in several divisions reverted during the year to the giving of 5 per cent trade discounts off ceiling prices and others made net prices all less than the ceilings provided by OPA.

Technically, of course, there has been no violation of the OPA price schedules, but these practices are unethical and are liable to cost the mills which made them and industry at large millions of dollars. For we have finished the year of 1942, and its operations are under scrutiny, analysis and study.

The OPA has embarked on a study of profits and earnings designed to measure and maybe control earnings, and further may reduce some price ceilings as one method of curbing excessive returns.

The paper industry faces 1943 with restrictive production operations and more to come, shortage and scarcity of raw materials, increased and increasing wage demands, and generally increased cover-all costs.

Some mills in some divisions already are so alarmed over this situation that they believe the industry should petition the OPA for an increase in ceiling prices.

On the face of it, this seems the only logical course to pursue. But just as sure as the industry makes the request for higher ceilings, they will be confronted with a breakdown of paper sales, many of them shown at below ceiling prices.

What's the answer? Either go back and operate at the permitted ceiling prices without deviation, or, because you have made profits and sold products below the ceiling prices, you have automatically demonstrated that they are too high and the present ceilings will be maintained or reduced.

There is a disposition of late, evidencing a desire on the part of OPA to work more closely and co-operatively with its advisory boards.

The industry should take immediate advantage of this attitude and at once see that analyses and studies of the industry's operations for 1942 are compiled and digested before any move is made for changing the *status quo*.

In the meantime, it does seem to us that it is encumbent upon every paper producer in the industry to get full ceiling prices for every pound of paper he sells.

It is costing more every month to produce paper.

When Peace Comes

▸▸▸ LEWIS H. BROWN, president, Johns-Manville Corporation, addressed the Washington (D. C.) members of the American Economic Association, January 5, on the subject "Using Private Business Agencies to Achieve Public Goals in the Postwar World."

Appearing as a layman, and talking in the language of a businessman, Mr. Brown made it clear at the outset of his talk that the businessman's approach in appraising trends usually is limited to the short-term future; and that, concerning the future, there are as yet almost no known facts, and but little theory upon which to go.

He also related that the businessman of today is not afraid of change; that change is the essence of progress; that industrial research is the actual process of improving on the present; and that any business which, in times like these, attempts to stand still or look backward is a business doomed to extinction.

In the opinion of Mr. Brown, the question of employment has been the major problem of Europe since the dislocations of World War I, and of our country since the crash of 1929.

A few gems of thought gleaned from the remaining remarks of his address may be worth the thoughtful consideration of every American. Here they are: "If we are to build soundly for the postwar future, it seems to me we must proceed according to the principle learned at such great cost in the past decade, that no government should enter into direct competition with its citizens, and that the government of a representative democracy cannot do everything for everybody.

"As an industrial engineer, I believe the private enterprise machine —streamlined—is the best from all standpoints to propel the American nation to new heights of spiritual, cultural and material progress.

"Honor and pride, properly appealed to, will put service in the common cause first, and the desire for profit second, as has been proven by this war. Co-operation, not conflict, must guide government, business, labor, and agriculture in their service to our people. From this new spirit and co-operation can come a new America that will be the Eldorado of the whole New World."

MIGHT *Is* RIGHT

WILLIAM SIBLEY

"As the rights of peoples and world respect exist only when they are backed up by force, Mussolini has combined Italian aspiration with strength capable of imposing them."

—VIRGINIO GAYDA,
Confidant of Mussolini

▶▶▶ MIGHT IS RIGHT. Might always has been right. The might of right ruled the world when our forebears roamed the rocks; when by his might the strongest among them pushed his way into the most luxurious cave, confiscated the juiciest steaks and grabbed the most beautiful woman. And though we may sincerely believe that right must ultimately triumph over might—tragic faith—so far as I can see (looking into the murky void) might will always be right in fact, even though it may not be right in truth.

The right of might has not changed, fundamentally, in its travels through the ages. Only in the *kind* of might used has there been any change. And in its greater aspects, its cruelty has become more refined. With our forebears, it was the might of physical strength that proved the right of possession; with us, it is the might of armament that dictates the right by which we live.

"The German race, that is our faith! It has higher rights than all others."

—DR. ROBERT LEY,
Reich Organization Director

Our minds span the oceans. There, to the East and to the West we behold great nations who, by the right of their might, ruthlessly exact what they choose to demand from other nations lacking the might to resist. With his vaster host, his broader sword, his greater guns, his tanks, his ships, his planes, the might of Mars will always be right. And his hapless hordes will always be given to believe that theirs is the divine right. In every war that has cursed the world since creation, the victors have sent up prayers of thanks to their particular God for the might with which He endowed them to fight for a righteous cause. Righteous cause! If it be not a sacrilege to say it, God must have had many a laugh at some of the prayers.

Fear

One of the basic characteristics inherent in every living being is *Fear*—the fear of losing to another that which we now possess. Or fear that we might not be able to exist without that which is now possessed by another. Such fear begets ambition, the driving force of might. Thus we observe Nazi Germany, fearful for its future and coveting the granaries, the oil fields, the mines, the ports of other nations. And so they become ambitious and by their greater might seek to seize what they wish without regard for the rightful owners. Thus we have Soviet Russia, fearful lest Communism will die if confined to its own borders, reaching its powerful paws across the boundaries and by the right of its might seeking to extend its powers into unwilling domains. Thus we see the Nipponese, fearful of their own congested areas, lifting their sweating millions by force and pushing them into and onto the even more congested areas of China, Burma and Thailand. Thus we find Great Britain and France fearful of being crushed under the growth of totalitarianism, rise in their own might to defend their democracies. And thus, unleashed upon the world, we have the great and gory God of War.

To the credit of our caveman ancestor, be it said that glutton though he may have been, he stopped wanting when he had enough. We, of the present *civilized* generation, never stop wanting. We continue to want for more even after we have had our fill. Obsessed with a desire for enjoyment of life, ambition for power and more power carries us so high that the very purpose of our effort is lost to right. And so we struggle for wealth to bring us might. And in the wild scramble for wealth we trample over others by the right of our might, or we are trampled upon by others who, by *their* might, have appropriated to themselves the right of way to the Temple of Mammon.

Big Fish and Little Fish

While we are here on earth with the power to think, we may as well accept as inevitable that might is right. And although we may acquire (to a greater or lesser extent) a decent respect for the rights of mankind, such acquisition is artificially acquired. Scratch the surface of our respect for the rights and possessions of others and underneath you will find a smothered conscience. To do unto others as we would have others do unto us is not inborn with us. Those of us who have learned this creed have learned it just as we have learned to eat olives and spinach. Greed, envy, covetousness — these are the natural traits, and though they may be hidden and veneered, no amount of hypocritical surface can obliterate them.

"It is not true that the nations of Europe are equal. It is nonsense to maintain that all nations have equal rights."

—BOERSEN ZEITUNG

Might is right. We of this unfortunate age are seeing the truth at its worst. We see that the small nation exists now, more than ever before in history, at the discretion of mighty powers. We see small nations threatened with complete subservience, and to annihilation if they should, by word or act, display their right of independence. . . . The ideal of world federation—again, tragic faith—seems now more utopian than ever. So long as the big fish in the sea swallow the little fish, so long as the jaguar in the jungle will rend the deer, so long as our neighbor's dog fights to death with our dog, so long as we shall be inborn with an ambition for power and a greed for more power—so long will might be right in this world.

Lest I be too severely criticized for painting so black a picture, let me repeat and emphasize, that might is always right only in fact, that is, by *fait accompli* though it may not be right in the light of truth. Right by might will be ever with us, but like the ravages of a deadly germ within the living body, which can be halted in its tracks and weakened to a state of impotence by the violet rays of God's sunlight, so can—so will—and so must—the ravages of ruthless might within civilization be subdued to a state of impotence by the strong light of truth.

"Will we ever learn to use reason instead of force in the world, and will people ever be wise enough to refuse to follow bad leaders or to take away the freedom of other people?"

—ELEANOR ROOSEVELT

today's armed forces roll on rubber.
But the chief source of supply has been cut off by the hazards of war.

This has made the manufacture of rubber products in sufficient quantity for the war effort a task of exceptional magnitude and difficulty.

That task is being surmounted. Rubber is going where it will fight most effectively for the common good.

Our production, large as it is, is now directly or indirectly requisitioned for war needs. We are cooperating with the Government in every way to insure victory as soon as possible.

BOSTON WOVEN HOSE & RUBBER CO.
CAMBRIDGE, MASS.

THE DYESTUFF SITUATION

Yesterday...

Today...

Twenty-five years ago the need for color was urgent. European sources of supply had been shut off and America's textile industry was threatened with a desperate situation unless it could get dyes quickly.

This brought about the birth of a new American industry—dyestuffs. It was little realized at the time how vital a part this infant was to play in the American scheme of living. The early struggles of the newcomer to survive were many. During its weakest years the textile industry fostered the infant, assisting in its development through helpful advice and guidance. It aided the dyestuffs industry in establishing products for which the need was greatest and by accepting these products it gave the necessary impetus to further research and planning.

The colors first manufactured left much to be desired, but textile mills were patient. They cooperated wholeheartedly and only a few years elapsed before manufacturers were turning out dyestuffs of highest quality, satisfactorily fulfilling requirements. The youthful industry kept growing—ever stronger—making an increasingly broader range of important products. Initial production of anthraquinone and thioindigoid derivative vat colors was well received by dyers and printers and the period 1920 to 1930 represented a decade of rapid growth. Complete lines of direct, developed, sulfur and acid colors were introduced, and subsequent years witnessed further expansion in the vat color field.

Development of the organic chemicals industry was paralleled by the growth in chemical education. Many of the chemists, chemical engineers and technicians trained during this period became leaders of the industry. The future was bright, the horizons were broad, the opportunities unlimited for the betterment of existing products and the development of new ones.

World War II—the United States has at its command a complete, integrated and self-sufficient organic chemical and dyestuffs industry, supplying great quantities of vital materials essential to the war effort. Its importance to our national welfare and security is further emphasized through its contribution of highly trained chemical engineering and technical personnel to the many chemical, munitions and powder plants necessary to carry on a global war.

The dyestuffs industry is supplying the armed forces with the fastest colors available which meet the rigid requirements for durability and service. In addition, there are over 1200 colors available for use in the manufacture of permissible and essential civilian textiles, paper, leather, paint, rubber and other products. Other important contributions to the nation's economy resulting from research in the dyestuffs field are neoprene chloroprene rubber, synthetic camphor, pharmaceutical chemicals, refrigerants and air conditioning chemicals, tetraethyl lead, textile and dyeing assistants, and water repellents.

The infant industry has reached maturity, shouldering its burden well. As far as chemicals and dyes are concerned, this country need no longer fear the consequences of isolation. This has been proved by the events of the past 12 months. Substitutions may occasionally be necessary because of priorities, allocations and other wartime contingencies but the dyestuff industry will do its utmost to satisfy all demands for colors. Du Pont is proud of the part it has played in the growth and development of the American dyestuffs industry. When the world is again at peace, lessons of the last thirty years will have served to give America—*Better Things for Better Living... through Chemistry.*

DU PONT DYESTUFFS

REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & CO. (INC.) ORGANIC CHEMICALS DEPARTMENT, DYESTUFFS DIVISION
WILMINGTON, DELAWARE

Newsprint Engineering

50 Years Ago and Now

A. H. WHITE

▸▸▸ THE SUPERIORITY of modern newsprint mills over those of fifty years ago is the result of slow and rather consistent growth. As one looks back over the years, improvements have been adopted gradually, but with an effect that is startling.

All of these developments by no means should be credited to professional paper mill engineers. Probably most of them have been contributed by mill superintendents and millwrights and by the makers of machinery. Many of the superintendents and millwrights perhaps had no engineering education in the commonly accepted meaning of the term but they were natural engineers.

In wood preparation fifty years and more ago, the wood was brought to the mills in long lengths where it was cut into two-foot bolts and then barked on disc barkers. In some cases, the bolts, if used for sulphite pulp, were trimmed of knots, pitch seams, etc., with saws, axes, and augers. One mill, at least, washed and brushed the wood before delivering it to the chipper.

Early in this century, barking drums came into use. The first drums (at least the first in this hemisphere) were of Bache-Wiig design—a batch drum of rather small capacity and small daily production. This drum never came into general use. Soon after its introduction, drums of slatted construction and continuous in operation were invented and adopted.

Two units of the first continuous drum known to the author were imported from Scandinavia. These drums were small in diameter, about four times their diameter in length, and ran in a bath of water. Their capacity was small, and, to work at all, they required wood of rather small diameter.

Modern drums are built in three sections. They are up to sixteen feet in diameter and aggregate up to forty-five feet in length.

The first of the modern drums were inclined, the idea being to facilitate the flow of wood through them. Soon, however, it was observed that the inclining of a drum was of no advantage. A dam at the inlet end made higher than a dam at the outlet end caused wood to leave the drum at the same rate as it entered. At first, a great deal of water was used in the operation but here again experience showed that a small amount of water gave better and quicker results. The early drums used two-foot wood; the modern drums, four-foot wood.

Today, great quantities of wood come to the mills peeled and in four-foot lengths. This practice rids the mills of a bark disposal operation and makes for easier handling of the wood. Bark removed from the wood at the mills may or may not be used for fuel.

Lately, a machine has been invented for rossing wood by means of high-power water jets. Some years ago, the author experimented with this method of barking, but no machine was developed that had sufficient capacity.

In the days when newsprint mills were rather small, the storage of wood was not much of a problem. As large mills were built, the quantities of wood to be carried through the winter required large areas of ground space and efficient means for storing and recovering the wood. Cable conveyors carried on high trestles were used at first but were superseded by crane-like conveyors filled with chain made up of detachable links. These latter conveyors carried the wood high in the air, piling it in great cones. Some of these pilers were on tracks so that the final pile from such a conveyor was in the form of a triangular prism. A recent practice involves the use of portable conveyors which can be lengthened and shortened at will and which

● Mr. White was born in 1868 at Bucksport, Maine. In 1895, Tower & Co., Holyoke, Mass., well-known paper mill engineers of the time, recommended him for the job of supervising the erection of a pulp mill at Webster, Maine. The following year he supervised the erection of a paper mill at South Brewer, Maine; and then in 1898 he became associated with the newly-organized International Paper Co. He remained with this firm until his retirement in 1940. Beginning his career with the firm as drafting room supervisor, he advanced during the years to division engineer, then chief engineer, and for some years previous to his retirement he was a vice president, serving in this capacity from 1927 until 1931. His tenure of service found him engaged in the building of a number of dams, several hydroelectric plants, several pulp and paper mills, important additions to various mills, and numerous other engineering projects.

● In 1942, the University of Maine, his alma mater, conferred on him the degree of Doctor of Engineering.

Recent view of machine room in Three Rivers (Quebec) mill of Canadian International Paper Co.

Mills of the Hudson River Pulp and Paper Co. (Palmer's Falls, N. Y.) in 1887. (From "The Paper World," Vol. 15, No. 4, Oct. 1887.)

are used both for storage and recovering of wood.

Nothing has been devised to supplant the disc chipper. Chippers, however, have been improved greatly as to efficiency and capacity. Likewise, chip screens of various types have been devised to remove slivers, knots and sawdust, resulting in great improvements over old-time methods.

Great changes in grinders have been made in the past fifty years. Old-time grinders had many small pockets and natural stones, and used two-foot or even shorter wood. Later, the three-pocket and four-pocket grinders for two-foot wood came into use and then came three-pocket grinders for four-foot wood.

Modern grinders are of the magazine or semimagazine type. The first of these grinders had two very large pockets fed from high magazines. Later, the Warren grinder was introduced. This grinder had a high magazine directly over the center of the stone and spur chains along the sides of the magazine to provide the desired grinding pressure. More recently there have been other grinder developments as typified by the Great Northern and Roberts grinders and by the general use of artificial stones in place of natural stones.

At least one mill, known to the author some fifty years ago, made use of grinders employing centrifugal force for pressure. These grinders, not at all satisfactory, incorporated vertical shafts and pans with corrugated inner faces in their design.

The first sulphite acid-making plants provided for passing the gas from flat burners, after cooling, through wood tanks containing milk-of-lime, the tanks being in cascade series. Today, rotary burners are used in place of flat burners, and towers of concrete with vitreous lining, in place of the wood tanks. The towers are filled with limestone instead of milk-of-lime. In their operation, the gas passes up through the stone; a stream of water comes down from the top.

The first sulphite digesters were built of cast-bronze sections or rings. They were not reliable because of the uncertain character of the bronze. Faults, which could not be seen from the outside, made them dangerously liable to rupture.

These early bronze digesters were followed by riveted steel shells lined with sheet lead. Here again was an unsatisfactory design because the lead would expand, wrinkle and leak, requiring the constant attention of lead burners.

The masonry lined digester with lead between the shell and the masonry came next. This type of digester also proved a failure because a leak in the masonry and a crack in the lead would allow acid to contact the shell, finally eating through it at some unpredictable point.

Finally, the modern lining was adopted. In this case, there commonly are two layers of acid-resisting brick which are separated from the shell by a thin layer of Portland cement. The jointing for the brick is made by combining litharge, quartz and glycerine.

Sulphite digesters also have increased in size. The old-time digesters were short and of small diameter. Modern digesters have diameters up to sixteen or seventeen feet, and heights of fifty feet or more.

In the old days, all pulp was made up into laps on wet machines. Because of the variable flow of rivers, groundwood was made in surplus quantities during high water and stored for use during low water. The cost of storing, recovering, and reducing in beaters was high.

During the early 1900's, the present method of shredding was invented in this country. While patents were taken out on the process, no royalties were collected. Today this system commonly is employed wherever lapped pulp is used.

After a time, slushed groundwood was pumped directly into the beaters. Lapped sulphite still was used. Then, both the groundwood and sulphite were handled in slush form.

The introduction of centrifugal pumps for handling high-density, slushed pulp was not without difficulties. The Harmon pump was one of the first of this type to be used for the purpose. It was characterized by propellers with radial blades and by a radial discharge. The pump was very inefficient. Its only virtue was that it could run in either direction. Later, centrifugal pumps of the conventional type were built to handle stock with a consistency of five per cent or more.

Apparatus for automatically controlling the proportioning and consistency of stock was developed in the first decade of the present century. The modern mill is equipped with mixing systems in which pulps, colors, etc., are mixed in large tanks. Such stock may be pumped directly from the tanks to the paper machine screens, or it may go through jordans previous to screening if some special refining is necessary.

Another development has been the use of broke beaters for doing away with the large piles of broke in machine rooms which, in the old days, had to be carted back to the beater room. It is common practice to locate the broke beater installation in the

basement under the paper machines so that broke never accumulates on the machine floor.

Perhaps, the outstanding feature of advancement in newsprint manufacture has been the modern paper machine. Fifty years ago, newsprint machines were comparatively narrow and slow running. At that time, 600 fpm was fast; and the widest machine known up to 1900 or later was a machine at Rumford Falls, Maine, having a 152-in. wire. Today, speeds approaching 1500 fpm and wire widths of over 300 in. are in use. Deep head-boxes, adjustable high slices, and level wires have supplanted the old-time low, rigid slice, and inclined wire. Other improvements at the wet end have included the introduction of suction couch and press rolls, granite top-press rolls, and the removable four-drinier.

At the dryer section, the Sheehan carrier, large diameter dryers, auxiliary hot air to aid drying, and compressed air for clearing the dryers after a break are things in common use but unknown fifty years ago. Likewise, improved doctors on the calenders and automatic reels are comparatively late comers.

In the old days, most machines were on the ground level. Basements or cellars under the machines provided space for engine drives, backlines, beater chests, pumps, etc. The modern mill has machines well above ground and laid on structural steel foundations. Then, too, steam turbines are directly connected to electric generators which provide power for the motors driving separate parts of the machines.

Electric drives for paper machines came into use during the first fifteen years of the present century. They have eliminated the old time backlines, cone pulleys, belt shifters, and gear trains.

There are four essential factors that must be considered in the building of a newsprint mill: (1) power, (2) abundant fresh water, (3) wood supply, and (4) shipping facilities. In the matter of power (steam and electric), water supply, and general planning, the professional engineer rightly comes into his own.

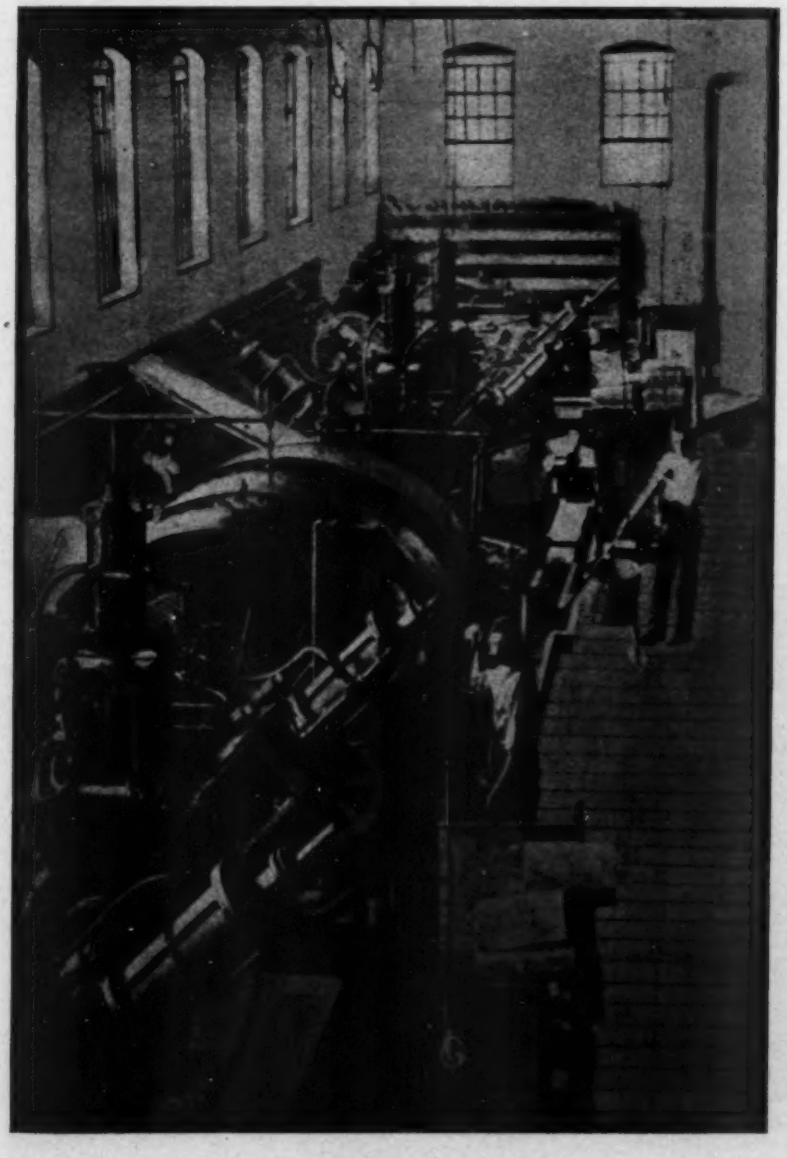
Fifty years ago, it was necessary to build a groundwood mill at the waterpower site where the grinders could be coupled directly to waterwheel shafts. As this site was on fresh water, that supply was taken care of, as was the wood supply which came down the river. Shipping usually was over a spur track which connected with the main line of the railroad. In some cases, all incoming freight had to be hauled from the railroad to the mill; out-going freight, from the mill to the railroad. In those days, the layout of a mill was dependent upon the waterwheel installation. Waterwheels were of low efficiency; and, for general power purposes, many long shafts and belts were required.

Today, a hydroelectric plant with high efficiency wheels would be installed at the waterpower site, or possibly at seaboard where coal is comparatively cheap (power lines at least 100 miles in length are practical); the mill would be built at a convenient place along a main line railroad or on tidewater; and the fresh water would be obtained from a nearby lake or stream, possibly from as great a distance as ten to fifteen miles. Wood would be brought to the mill by rail, steamer or truck if it could not be driven.

The general layout of a mill of today is greatly simplified. The use of powdered coal and high pressure steam results in great economies. In mill buildings, structural steel and reinforced concrete largely have supplanted the use of wood. Such construction with non-burning roofs makes the buildings almost fireproof.

If a deceased papermaker of fifty years ago could come to life now, he hardly would recognize a modern paper mill. It is doubtful if such great changes as have taken place in the industry were envisaged by him. Succeeding years probably will show similar advancement. Possibly, paper will be dried by electricity; even now some machines are controlled by electronics.

A grinder room of forty years ago in the mill of Glens Falls Paper Co., Glens Falls, N. Y. (From "The Paper World," Vol. 25, No. 3, Sept., 1892.)



PUMP MAINTENANCE

FRED D. MOSHER

▸▸▸ REASONS FOR DOING A SPECIFIC maintenance job are usually clear. Equipment must be cared for to retain its usefulness, to keep its reliability of a high order, and to forestall outages which might interrupt operations. In pulp and paper mill pump maintenance, another good reason must be added. Such pumps must be efficient. The quantity of material handled per unit must not vary greatly over a given period. Therefore, wear and tear must be kept at a minimum.

Pump Inspections

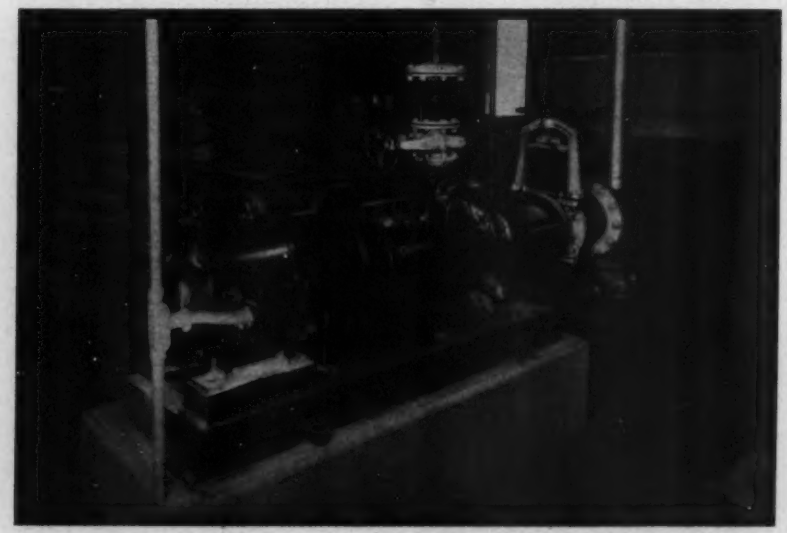
Hand oiling and greasing are properly the duties of employees concerned with operation. Operators should make daily inspections of lubrication. They should note starting difficulties of intermittently operated pumps as well as pumping pressures. Leakage should be observed and abnormal amounts should be immediately corrected. They should report any unusual conditions.

Monthly inspection of all pumps should be made by the maintenance department. At the monthly inspection, packing glands should be checked and seals should be examined. The condition of water-cooled bearings should be noted with reference to supply of water and any heating of bearings. Where packing leakage needs adjustment, it should be made to provide minimum dripping. Test gauges should be applied to pumps not so equipped so that pressures may be compared with standards.

Listening with rods or other devices is part of the inspector's job. Unusual noises inside a pump often indicate troubles to come. Where leaks at flanges have developed, gasket replacements ought to be made.

The yearly overhaul and inspection is properly the duty of the maintenance department. On this occasion, important pumps should be opened for internal inspection and the pumps cleaned. Liners of cylinders should be examined for corrosion; wearing plates of high duty stock and other centrifugal pumps must be examined for wear and the clearances checked; and major repairs and replacements should be made.

All pump packings should be renewed each year except where service dictates more frequent renewals. The fact that trouble does not develop within a year does not mean that the packing should be continued in service. Chemical action, drying out, and wear and tear make most pump packings disintegrate rapidly once the wearing process begins. To continue packings in service beyond their normal useful lives is to run the risk of trouble with pump parts. Dried packings lose their ability to seal rods and shafts; and repeated tightening of glands may score rods or actually distort them to the point where expensive repairs and costly outages are necessary.



A 4-in. paper stock pump easily accessible for inspection, repairs, or overhaul.

Pump Troubles

Abnormal wear and tear and air entrainment are the most serious pump troubles encountered in paper mill work. Both of these troubles reduce pump efficiency. In extreme cases, they lower total mill capacity.

Abnormally high stock consistencies with partial clogging, water drainage, and bad control may give trouble with air entrainment. To prevent loss of capacity from air binding necessitates consistency control. Air binding problems also are aggravated by uneven flow brought about by the worn internal parts.

Gauge lines and vent lines, subject to clogging, must be kept free. Pockets in adjacent piping must be eliminated.

Difficulties contributing to the major troubles of a centrifugal pump usually are located in the moving parts and surfaces over which the flow passes. Supporting stationary parts, of course, are subject to vibration from the drive and surrounding apparatus; and such vibration will aggravate difficulties with the moving parts. The impeller must operate smoothly and must be kept in good alignment. The shaft, bearings, stuffing box, and packings are all sources of trouble. When good packing maintenance is practiced, the job of pump maintenance is simplified.

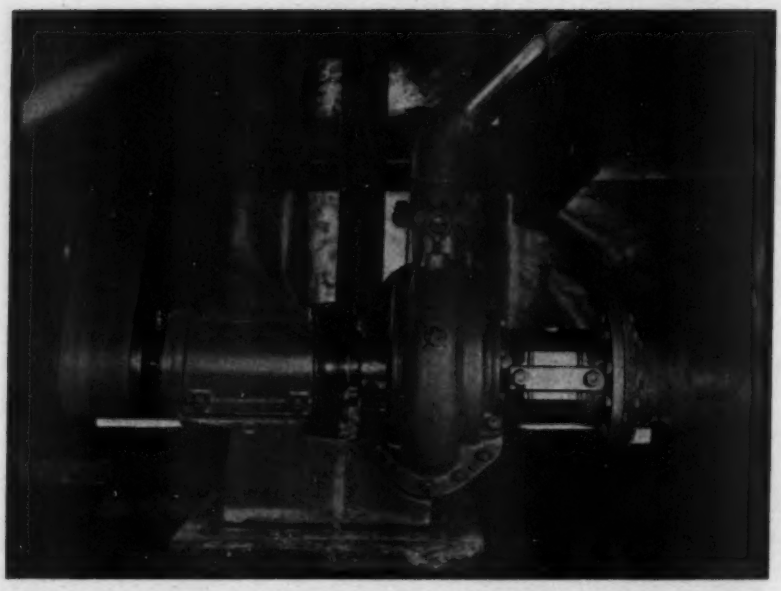
Packing Maintenance

The first requisite for good packing maintenance lies in the selection of the packings, and the maintenance of the packing inventory so that substitutions are not necessary. There is a correct packing for every service. An "all-purpose" packing is non-existent.

The selection of a specific packing is influenced to a certain extent by the condition of the pump being packed. Packing will not correct for a scored or worn rod, corroded parts, bad alignment, or poorly fitted glands. A packing chart is useful in the preparation of a list and also as a guide in selecting the right packing for a given job.

The job of packing a pump in a paper mill should be entrusted only to employees who can do a good job and who realize the importance of doing the job correctly. To prepare a pump for packing the old packing must first be removed from the stuffing box. Then the rod, stuffing box, and the old packing should be examined for evidences of trouble. A scored rod or sleeve may continue to get worse if packed without correction.

A low bearing would be indicated by the reduction in cross-section of the packing directly beneath the rod. When such a condition is found, the pump bearings should be examined for wear, and the condition of the oiling



Sulphite stock pump operated through belt drive and delivering 400 gpm. In addition to the pump, special attention should be given to the belt, pulley, and bearings of such installations.

system should be inspected before the pump is returned to service.

A misaligned rod or shaft would reduce the packing cross-section directly over or on either side of the shaft.

If packing rings are missing, it may mean that too much tightening of the gland between packings has forced some of the packing into the casing. This condition frequently occurs when pump packing is treated as a minor detail and slipshod methods are used. Outside wear on a packing indicates that a poor fitting job had been done when the pump was packed previously, and that the packing had moved in service. This condition would result from the use of slightly undersized packing.

If rings were cut too short on the old packing, it would show bulging where the gland pressure had forced adjacent rings through the joint.

Too great a clearance between the shaft and the gland follower would cause the packing to extrude between the shaft and the follower.

Excessive pressure and lack of proper lubrication would be indicated by a charred, hard surface on the inside of rings. The outside of the rings would remain in good condition.

Much can be learned from the condition of old packings, and the habit of making diagnoses is good maintenance procedure. Only packing made of the right material and of the exact size should be used.

Packing cannot be expected to correct for wear or misalignment. It is purely for sealing.

Where packing is used as a set, no set ought to be broken. Adding rings to an old packing job is not good practice. When oversize packings are used, excessive friction results. When the packing is undersized, too much tightening is required; and often the sealing is imperfect.

In cutting packings, it is important that clean cuts be made. There should be no ragged ends. Taping adjacent to a cut will permit clean cutting.

Whether a small amount of clearance is allowed at a joint, or a tight fit is made, is a matter of choice based on experience. The majority of opinion favors exact fit for all packings. Exact fit is obtained best by cutting the rings on an improvised mandrel of the same size as the shaft being packed. Each packing clearly labelled as to size, type, and service should be kept in a clean container; and care should be taken to prevent dirt or grit from being transferred to it during cutting and fitting.

After all accumulations of packing particles, dirt, and other foreign material have been removed from a stuffing box, the box should be cleaned along with follower and shaft before repacking.

Fibrous packing should be soaked several hours before cutting and fitting. If desired, the packing may be pushed in place with a ram made of fiber, wood, or pipe and designed to fit around the shaft. The joints of the packing rings should be staggered at 90 degrees in a clockwise direction. When lanterns are used for oil or water sealing and lubrication, the cage should be lined up with the opening in the stuffing box so that the sealing medium may pass freely. When all of the packing rings have been added, the gland should be taken up gradually until it becomes tight. Further tightening with a small wrench should serve to fit the packings firmly. Then the gland should be backed off to a loose position and taken up finger tight.

In most cases, a newly packed gland should leak slightly. Frequent take-up for the first few days after packing

Flanges on pump discharges require regular gasket renewals. This propeller type pump circulates 2,800 gpm of 0.3 per cent stock.

is necessary. If any of the bolts are damaged around the threads, they should be reconditioned before returning the pump to service. Unused packings should be returned to containers and stored in a clean, cool place.

Pump Maintenance Records

It is good practice to have each pump catalogued as to maintenance record, operating characteristics, and other pertinent data, such as packing requirements, spare parts, and method of repairing and overhauling. The record should be started when a pump is installed, using the manufacturer's instructions, characteristics of pump, and nameplate data as the original data. Each pump should have its card or cards kept in an individual folder. If such a history of each pump is kept, the record developed as time passes will be of considerable value.

One inspection record should be filed on each pump every year. As each inspection is made and recorded, the record of the previous inspection should be removed from the file.

Gasket Maintenance

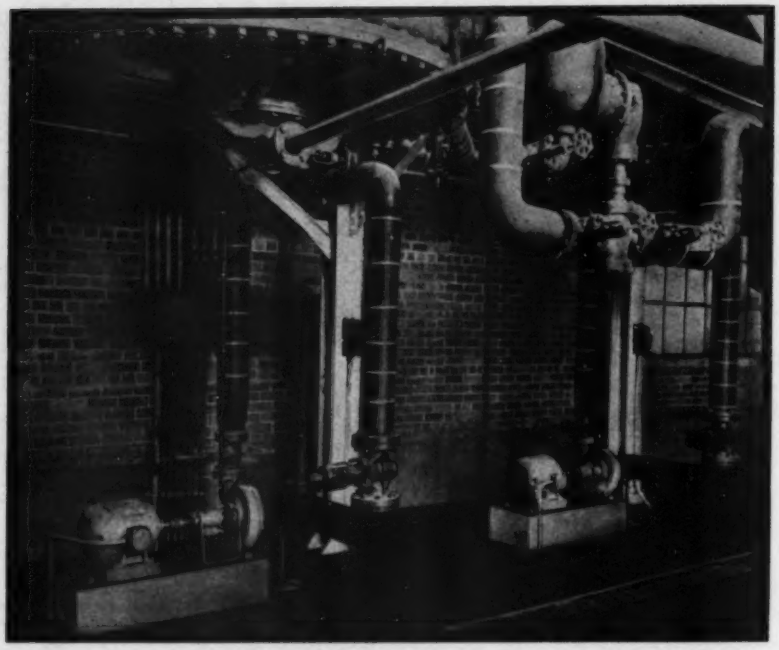
Gasketed joints of pumps and their connections should be renewed annually with material of thin cross-section. Gaskets will not take care of expansion; and, where surfaces are in good alignment, a thin gasket will make a good joint without stressing bolts or flanges. Before installing a new gasket, the flange faces should be examined for scoring, cutting, and other defects likely to give trouble if not removed. Dope ought to be used sparingly, and on one side of the gasket only. Oil or grease compounds must not be used as dope for rubber or composition gaskets.

Special Packing

A pump of special design may require metallic packings which are furnished in sets by the manufacturer for a specific job. In a case of this kind, it is always advisable to follow the manufacturer's instructions implicitly. When such a pump becomes worn, the manufacturer should be consulted as to procedure.

A badly worn shaft will not operate satisfactorily, regardless of how special the pump packings are. Either a worn shaft must be turned down and new packing made up, or a new shaft must be obtained of duplicate dimensions. If operating conditions do not permit such a unit to be shut down for repairs, soft packings (cut eccentrically) may serve until a more complete job can be done.

The fibrous packing used for piston packing on piston type pumps is cut on the job to fit the installation. Layers are peeled off the packing, preferably after being soaked in water overnight, until a strip of sufficient depth remains. Then this strip is cut with a lap provided at the joint for fitting. The joint is provided with a slight clearance, and successive joints must be staggered at 90 degrees.



Chemical pumps should be packed with special acid-resisting or alkali-resisting packings. The pumps shown are from a group of nine handling black liquor between effects of a multiple effect evaporator.

Most centrifugal pumps operate at high speed. For this reason, packings must be selected and installed with care. Hard packings are not recommended. Braided cotton packings and similar materials impregnated with lubricant generally are used for moderate temperatures and pressures. Blue fiber asbestos packings are used where the substances handled are acid or corrosive in nature. Lubricated and graphited asbestos materials are used for high temperature service. In selecting packings for a given installation, the advice of the pump manufacturer should be sought.

Care of Idle Pumps

Strictly speaking, no pump should be kept idle for an indefinite period. When a pump is out of service for some weeks, it should be operated at least once each week. If it cannot be driven by power, provision should be made for turning by hand.

Packing glands should be loosened. Where freezing may occur, and heat cannot be provided, the pump should be drained of all water. If the pump is kept heated, it usually dries out the packings unless precautions are taken to prevent it. If the packings have seen considerable service, new packings should be installed before placing the pump in regular operation.

An idle pump must be protected from corrosion. If its internal parts are non-corroding, it may be only necessary to clean these parts before the pump is returned to service. All external parts, however, should be cleaned and covered with a film of grease for protection against rust and pitting at the time of the shut down. If the annual overhaul is made on a pump at the beginning of the idle period, the valves, cylinders, impellers or pistons, and shafts should be cleaned and left in a dry condition for the layup.

Maintenance can never become disassociated from operation. The best maintenance program will be of no avail if the equipment is not operated in accordance with good practice. Provision in the operating schedule must be made for regular pump outages for annual inspection and overhaul. The equipment itself must be operated in the service for which it was intended. Today, each pump must be treated as if replacement were impossible for some time to come. Each unit must do its job; maintenance cannot be neglected; and operation must be reasonable.

***AUTHOR'S NOTE:** The illustrations used with this article are from photographs supplied through the courtesy of Worthington Pump and Machinery Corporation, Harrison, New Jersey.*

Public Relations Looks in on the Paper Industry

WORTH COLWELL, President
Korbel & Colwell, Inc., Public Relations Counsellors

▸▸▸ WHEN THE CONSTITUENTS OF any industry do not think and act in harmony with one another, that industry must be a prey to confusion — subject to misjudgments, unjustifiable criticism, and undervaluation by the public. Because of no common objective, no singleness of purpose and no directive effort, the motive of self-preservation in such an industry would be likely to rise above creative ambition. Likewise, where general product improvement is lacking, price cutting would be apt to cause retrogression.

"Free enterprise" is rather an empty phrase unless the exercise of freedom leads to higher achievement. Sometimes the attitude of Mr. Big is, "Sure, I'm for a unified front, but just wait a day or so until I perfect some arrangements to get ahead of a couple of my competitors."

Personal observation seems to indicate that the principles of industrial unity, so faithfully practiced by some of the more spectacular industrial groups, have a very proper place in the thinking of the pulp and paper industry as a whole. Here is an aggregation of enterprises representing the widespread growth of one of the oldest of the useful arts. It has multiplied and prospered, and spread itself into every corner of the business world. However, it seems to have lost to a degree that one thing needed to protect and preserve its own integrity — and that is unity.

Lacking unity, the industry is vulnerable from several angles. Adjustment to the needs of wartime has been difficult for it. Lacking a common directive, its outlook appears clouded with uncertainty — some of which may be needless.

Constructive planning for the long pull is difficult. The temptation is to drift.

Is that good sense for any individual concern (no matter how small), for the industry as a whole, or for its component groups? Without a voice to interpret its efforts in terms of the vital war economy or to pave the way for advancement through the period of reconstruction, the industry now looks ahead to the postwar period — a period at present obscured by many doubts and fears.

For illustration of this defection, consider how the Government has found need to co-ordinate one industry after another in the war effort. Isn't it possible for any industry to do a similar job for itself without trespassing on Uncle Sam's prerogatives? In fact, voluntary co-ordination is going on, and most effectively in a number of instances.

In such cases, the industries are practicing the art of self-advancement. They are maintaining sound relations with the public. They are bending every effort to research. They are giving the public and the Government the benefit of achievements and discoveries of research as fast as is practical.

Were specific mention necessary in this connection (which no doubt it is not), the author would say, "Consider what you know about the conduct of railroads today . . . Look at the commercial airlines. As an outsider, what do you know about the efforts of the automobile industry, which has completely sacrificed its normal activity in the interests of the war effort . . . or of what the rubber industry is doing"?

One need not go far to find industries which possess the courage and the integrity to maintain a unified front in these trying times. The strongest evidence of this contention is the ability of these industries to tell the world about themselves and to keep themselves before the public as industries and/or as individual business undertakings.

A recent survey by the National Association of Manufacturers in widely varied fields revealed that among 181 companies reporting (about 8 per cent of all that are known to have laboratories) the typical company spends about 2 per cent of its gross sales income in a normal year for research.

The same survey showed that 1,008 companies, spent $117,490,000 for research—an average of 1.1 per cent of sales. Many of these firms spent several times this figure. One-half of them spent considerably more for research during 1941 than for the previous year; whereas some of the paper manufacturers spent materially less than the average percentage figures.

Much of the research has been conducted by individual companies seeking new or extended markets. Individual pulp and paper manufacturers, to be sure, have been working on the development of new paper products and uses for a number of years, but some companies might wisely go farther with the work.

What about making paper products as a substitute for something quite different? What about a pulp or paper derivative comparable to some of the new synthetic rubbers?

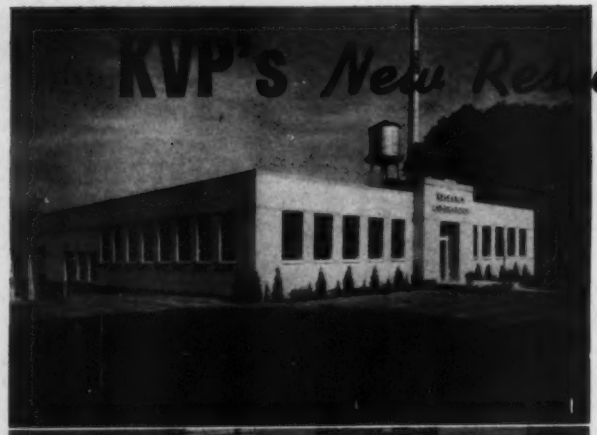
Some concern having done adequate research undoubtedly will launch a surprise before very long—and make a lasting dent in the market—for that is what happens in any major industry when research becomes intensive. Several new paper-pulp products may be awaiting disclosure right now.

Top flight chemists believe the paper industry in the near future will produce some radically new synthetic fabrics which will be used for apparel, furniture, and upholstery, as a substitute for rubber, textiles, alloys, etc., and that these fabrics will not be tender like ordinary paper, but will wear well. New discoveries in weatherproofing, toughening, hardening, and impregnating paper with other substances, using it as a base or ingredient for new plastics—not merely in the laboratory or in a small way, but in mass production—may be surprising. Paper soon will be used as a substitute for metal in many more ways than at present. It also will be substituted for rubber, fabric, wood, artificial stone, etc., to a much greater extent than at present. Some of its 15,000 uses, both civilian and military, will develop far beyond expectation.

How limited is this new purpose field? Who knows? To be sure, in this country, pulverized pulp and paper, as contrasted with reports of practices in Nazi Germany, is not being used as a padding and diluent for foods. In Germany, however, reports indicate that pulp fiber, in powdered

(Concluded on page 1134)

KVP's New Research Laboratory



▶▶▶ NEAR THE SOUTH END of the property over which is spread the great plant of the Kalamazoo Vegetable Parchment Company at Parchment, Michigan, and directly across the road from the home of "Uncle Jake" Kindleberger, founder of KVP and now chairman of the board, is the company's newest building. This new Research Laboratory is at the front end of the former laboratory which is now used for the pulp testing laboratory and for general storage of laboratory equipment. Company fire trucks are kept in one rear corner.

The accompanying illustrations vividly tell the story of the careful planning and the up-to-date equipment that have been put into this laboratory. A combination of fluorescent lights, natural skylights, and general placing of lights and fixtures furnish uniform lighting so necessary in color work. All the walls are of tile—the lower part of glazed tile for easy cleaning; the upper half are done in dull finish tile to eliminate glare. The floors are asphalt tile. The laboratory is air conditioned and well insulated.

Two of the rooms are not illustrated. There is a constant humidity room which is still not completely equipped. It will contain instruments for physical tests. Another room will be devoted to the special testing of papers other than the usual physical tests, such as brightness, color, transparency, opacity, surface smoothness, sealing strength, etc.

Shown in the illustrations are:

1—General exterior view of the Laboratory.

2—Corner of the main office. Seated (L to R) are: Rudolph Germanson, Reginald Hurst, and Dr. G. F. Des Autels, head of the Research Department.

3—Educational material is available for all employees in the library which is well stocked with technical books and business magazines. General conferences also are held around the long table.

4—A view of the main chemical laboratory. The big hood at the right covers heating apparatus and is designed to carry out fumes, odors, gases, etc., both heavier and lighter than air. Stock cabinets are under table tops. Apparatus for making greaseproof tests, tests for lard penetration, etc., is on the second table.

5—A group of laboratory technicians hold a conference around the big table in the library. Left to right: Milo Nelson, William Kottman, Rudolph Germanson, G. F. Des Autels, Reginald Hurst, William White, and William Hathaway.

6—(See No. 8.)

7—These package test cabinets will maintain any desired temperature and humidity above room conditions up to 150 Fahr. and 95 per cent relative humidity (Ed Henton opening doors).

8—This illustration, and No. 6, are sections of the biological laboratory. Note test tubes and cultures in incubators, also bottles containing stains, reagents, etc. Special lamps for use with microscopes when studying slides (William Kottman at microscope and incubators).

9—This Mayer Laboratory coating machine will give experimental treatment to many papers with close-to-production results. The chief benefit is a uniform application of such things as waxes, oils, lacquers, tub sizing, etc., in controlled amounts, producing samples large enough for laboratory tests.

10—Analytical balances and ovens. At extreme right a muffle furnace for determining ash content. Note bench which is a solid concrete slab to reduce vibrations (William White at scales).

11—Packaging and ink testing laboratory (Operator, Milo Nelson).

8

9

10

7

11

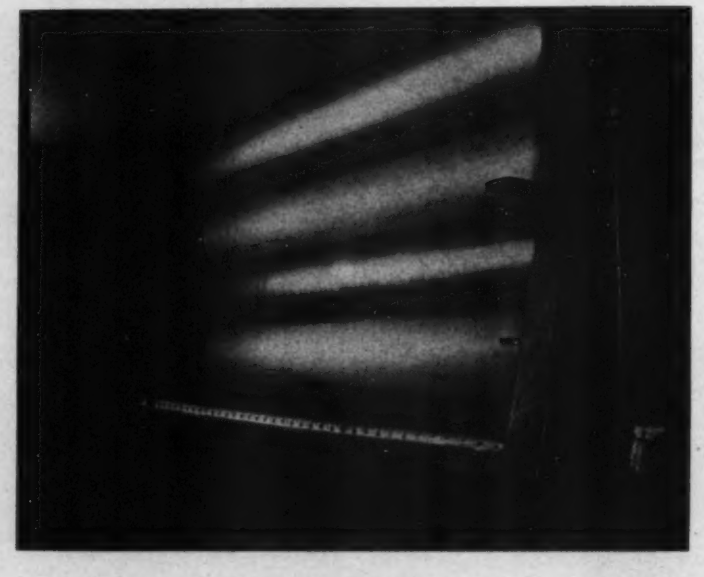
CALENDER COLORING

F. O. SUNDSTROM, Heller & Merz Dept.
Calco Chemical Div., American Cyanamid Company

▸▸▸ WHEN A SOLUTION of color is applied to a sheet of paper, a continuous film of the color is deposited on the surface of the sheet. A portion of the film penetrates into the paper itself. In some cases, it appears as if there is little, if any, color which has not penetrated into the paper. In other cases, it appears as if a great deal of the color has been deposited on the surface, with little penetration.

If a calender colored paper is torn, it will be noted that the depth of color is progressively weaker as the distance from the surface is increased. The maximum concentration of color is always at the surface of the sheet.

The film of color so applied is transparent and the shade of the finished paper will be the sum of the shade of the base fiber plus the shade of the dyestuff. It is not possible to ignore the color of the paper fiber itself. Of course, the higher the concentration of the dyestuff solution applied, the less influential is the base fiber. This influence, however, can be minimized, but it cannot be eliminated.



Calender staining is, therefore, an economical method of coloring paper. It is particularly adapted to the production of board in which only the liner is colored. This economy is obtained largely by coloring only a part of the material which usually is colored by beater dyeing. For example, when the full 5 points of a 5-point liner, when colored in the beater, are colored. In calender staining, however, the colored portion need only be 2 or 3 points, depending on the penetration of the stain solution. This saving alone has merit. In addition, it is possible by this method of coloring to reduce the amount of liner necessary to get a smooth color.

It also happens that this method of coloring makes it possible to operate with a much wider range of colors and to use certain colors which generally are not adaptable to beater coloring. This adaptability applies particularly to Tartrazine and Patent Blue, as well as the deep shades of Acid Orange, Crocein Scarlet and Metanil Yellow. The last mentioned three colors can be beater dyed, but if used in large quantities in order to obtain deep shades, their brilliancy is definitely impaired.

In beater dyeing, the amount of color that can be fastened to the paper fiber is definitely limited, both from the viewpoint of economy and also from the point of retention. There is also the fact that, up to a certain point, the increments of dyestuff added to paper pulp in a beater will give a corresponding increment of color strength. Beyond this point, any addition of color serves to cause a dull bronziness and is definitely detrimental. It can be seen that beater coloring definitely is undesirable in the production of deep shades.

Calender staining is the only method that can be used to obtain deep, intense shades; and even with it, if the color solution used in staining a paper is concentrated excessively, bronziness will result. The amount of dyestuff in a color solution which can be applied by calender staining to a sheet of paper or board without bronzing will vary with each color.

The bronzing tendency of color solutions can be retarded by the use of various chemicals. Butyl "Carbitol" is one chemical that shows promise in laboratory trials as such a retardant.

Calender staining is used to supplement beater coloring of many boards, that is, the liners are colored with a combination of beater color and calender stain. This practice has the advantage of producing a board which has the economy of a calender colored paper and the colored liner of a beater dyed color. It is particularly of value if the board is subjected to creasing or scuffing.

Calender staining has the distinct advantage of making it much easier to clean up a machine after a run of a particularly heavy color. Every papermaker who has run a deep black in the beater knows the trouble which must be taken in order to clean up the machine and equipment after such a run.

Besides those instances when a beater colored bottom purposely is topped with a calender stain, occasions frequently arise when such staining is very advantageous to touch up a run to the standard shade. In this way materials which would be considered unacceptable, or at least troublesome, can readily be made into a salable product.

In running colors of any kind, it is seldom that some slight adjustment is not necessary on the machine. When calender coloring is used, such adjustments are comparatively simple and rapid, and there is a minimum of waste of both paper and color.

All calender colors, however, have one common disadvantage. They all bleed. It is an inherent drawback. Bleeding is particularly undesirable in suitboxes, because if a carrier of such a package gets caught in the rain and allows the package to come in contact with gloves or clothing, the color will be transferred on them. If the material which has become soiled is white, washing and bleaching are comparatively easy. When, however, the soiled clothing has a background of color, the problem is quite different, due to the fact that the stripping agents which would remove the undesirable color generally will remove the color from the fabric itself. There is, of course, a difference in the degree of bleeding; and some colors can be treated to re-

tard the bleeding noticeably. This latter possibility is, however, the exception, rather than the rule.

Unquestionably, in the author's opinion, the industry may look forward confidently to the time when, as a result of more thorough study, paper or board will be treated on the calenders with colors which will be fast to both light and bleeding.

There is another objection to calender coloring which applies particularly to board. In many cases, paper, which has been colored solely at the calender, is not suitable for use where scuffing or creasing will expose some of the uncolored portion. This objection could be circumvented oftentimes by partly coloring in the beater and finishing with a calender stain.

While it is true that most colors are soluble in water, all colors are not equally suitable for application at the calender. The colors which are used in dying paper are classified as Acid, Basic, Direct, and Pigments. All of these groups are not equally suitable for calender staining. Pigment colors, while miscible or dispersible in water, are not soluble. As a result, lack of tinctorial value, uneven coverage, and objectionable crocking make them generally unsuitable for calender application. Likewise, direct colors are seldom used for calender staining, chiefly because their lack of solubility prevents the production of a smooth, uniform stain of any real depth. Another point not in their favor is that as a group, they are precipitated by alum. Since most papers or boards contain a small amount of alum, the precipitating action of this ingredient tends to give an uneven stain. There remains, therefore, only the acid and basic color groups to consider seriously for this type of application.

Acid colors as a class are most soluble, and therefore most suitable for calender application. In themselves, they have little, if any, affinity for vegetable fibers. In beater dyeing, they are mordanted on the paper fibers by the use of size and alum. Consequently, in calender staining, where the unmordanted color is applied, it does not fix itself firmly on the fibers with which it comes in contact, but rather spreads itself uniformly over the whole area of contact. As a result, the smoothest and most uniform stains are obtained with acid colors.

The colors of this class which have found the widest application are those which are the most economical to apply. Acid Orange Y, C. I. 151, for example, is one of the most soluble aniline colors. It is tinctorially powerful and cannot be equalled for staining use by any other color. Thus all oranges, browns, redtoned yellows and yellow-scarlets contain a goodly percentage of this color. In addition, it is used as a shading color in tans, blacks and many other shades.

Crocein Scarlet M00 Conc., C. I. 252, is another color which is practically impossible to supplant. It is a brilliant scarlet of excellent solubility and money value. It is an excellent staining color, and is used as the major component of most reds, and as the red element in many blends.

Metanil Yellow, C. I. 138, is an outstanding color for calender work. It is tinctorially strong and an excellent stainer. Acids, however, tend to dull the shade somewhat. The addition of a small amount of soda ash overcomes this tendency and, in general, most acid color calender stains are benefited by its use.

Soda ash is a water-softening agent. If the water is treated with it before the color is added, definite advantages in solubility will be obtained, particularly where hard water is used.

There are a few colors which are sensitive to alkali, naturally, soda ash cannot be used with them. Specific information on such colors should be obtained from the supplier.

Acid Black 10BN Conc., C. I. 246, is another excellent staining color. The shade obtained with this color is not a true black. In fact, the color is seldom used alone, but usually is blended with Acid Orange Y, Metanil Yellow MXXX Conc. or Crocein Scarlet M00 Conc. to give deep, rich blacks. Blacks made with such combinations are second to none for working properties, tinctorial and money value. In addition to its use as a black, this color, alone or blended, finds extensive use as a dulling agent in blues, greens, tans, and browns.

Some combinations of colors stain better than others, apparently, because of their more ready absorption by the paper fiber. To overcome such a condition, a color as near the shade desired as possible should be used, rather than shading to the desired shade with two colors which in themselves are quite different in hue. For example: to produce a bright blue of medium shade, it is more desirable to obtain the shade with a blue very close to the shade desired and shading with a small amount of violet, than to use two colors on the opposite end of the spectrum, such as Patent Blue and Acid Violet.

The remaining group, the basic colors, are not as popular for staining work as the acid colors, but there are circumstances where they can be used to advantage. Taken as a group, they possess more tinctorial value than any other group. For example: there is no dyestuff known which can even approximate the strength of the Basic Violets. Methyl Violet 4BPX Conc., C. I. 680, because of its low cost, is the most popular member of the group. The Ethyl and Crystal Violets, except where maximum brilliancy is required, do not find much use in calender staining.

Green MX Conc., C. I. 657; Auramine 00, C. I. 655; Fuchsine, C. I. 677; and Methylene Blue 2B Conc., C. I. 922, individually are colors of high tinctorial value. Where the prime factor is economy, this type of color must be used. Fortunately, of the calender colors, the basic group possesses the best fastness to bleeding. Light shades made with these colors show surprisingly good results. These results probably are due to the affinity of the dyestuff for the paper fiber, or to some real dyeing that takes place in the staining operation. In addition to the affinity of the dyestuff for the fiber, these colors respond readily to treatment with various mordants.

Certain precautions should be followed in handling basic colors, if maximum benefit is to be obtained with them.

Basic colors should never be boiled. Boiling of these colors tends to form tar, and the formation of tar in the dissolving tanks or the color boxes on the machine spoils paper. Auramine and Chrysoidine should not be dissolved in water over 150 Fahr. Other colors of the group may be dissolved in water at 180-190 Fahr., but the use of a steam hose for boiling the color solution is not recommended.

Soda ash should never be added to the water in which basic colors are to be dissolved. Basic colors are soluble only on the acid side. Alkali throws them out of solution or destroys them.

Acetic acid is not always necessary as the dyestuffs frequently contain enough acid to give satisfactory solutions. Whether they do or not, depends a great deal on the water being used. An alkaline water should be acidified slightly with acetic acid before adding the color.

Basic colors are not compatible in solution with acid or direct colors, and should never be mixed with them. In fact, in some concentrations, basic colors are not compatible with each other. On the other hand, acid and direct colors are compatible with other members of their group or with each other.

To obtain the most satisfactory calender stain, it is necessary to produce a sheet of paper or board most adaptable to this type of coloring. The most important features of such production are the sizing and a smooth formation. A slack sized rather than a highly sized sheet of paper is most suitable for producing deep, level shades. The sheet

should have sufficient size in it to prevent the absorption of an excess of water and incident curl, but not enough to prevent the absorption of sufficient color to make a smooth, even stain. It is short-sighted to attempt to stain a hard sized sheet by the addition of a penetrant when such a condition is not necessary. There would be a saving of both sizing and penetrant in the use of a slack sized sheet. This practice does not preclude the use of penetrants. It is merely a question of economy.

Penetrants, as a group, are a comparatively new addition to the line of dyeing assistants. Due to the large number of them, care should be taken in making proper selection.

Alcohol has long been a standby as a penetrant, but newer products, largely because of their superlative performance, are rapidly taking its place. It is fortunate that such a condition exists at present, since so much alcohol is needed in the war effort. Anything that the paper manufacturer can do to alleviate this need will be very worthwhile.

Foam long has been a source of trouble to the papermaker. It is not surprising that it crops up in calender staining. Sometimes it is due to the color, and sometimes other factors are just as responsible.

Foam troubles and their correction is a very interesting field for experimentation. There seems to be a surprising lack of information on the problem. Probably there are a score of remedies on the market, and just as many home remedies. The peculiarity of the problem is that what solves it in one mill does not work in the next.

There have been cases where adjustment of equipment has been beneficial. A high speed pump is not as desirable as a slow, steady pump in the handling of a color solution because of its tendency to whip the solution into a lather. The design of the color box has been known to have a material influence on foam elimination, and the control of temperature also is of some importance. It likewise has been observed that the foaming of Methyl Violet is reduced materially by cooling the staining solution.

There are certain problems in any manufacturing process. The application of color at the calender is no exception. In the past, these problems have been solved by splendid co-operation between paper manufacturer and dyestuff supplier. It is only natural that such a condition should prevail since both can contribute specialized skills. The problems of the future no doubt will be more varied and complex than those of the past. However, with the same co-operation as in the past, early solution of the problems should result to the mutual benefit of both industries.

★

OUR MEN NEED
*** BOOKS ***

SEND
ALL YOU CAN SPARE

Help a man in uniform enjoy his leisure hours. Give your good books to the 1943 VICTORY BOOK CAMPAIGN. Leave them at the nearest collection center or public library.

★

Public Relations . . .

(Continued from page 1129)

form, is combined with ground-up potatoes and turnips, and is mixed into bread, flour, sausage, hash, and other foods. If the proportion is not too great, it is unnoticeable to the taste.

"But I wouldn't want to convert our paper mill equipment to manufacture any new line," a mill executive told the author recently, and twenty-five years ago, the manufacturer of a standard kitchen article told him precisely the same thing. Today, the latter's factory is turning out tanks. A leading silk manufacturer of more than a quarter of a century ago also declared emphatically that his company would never manufacture a single yard of artificial silk—that it would have to be real silk or nothing. During the last decade, that company's business has been chiefly rayon fabrics.

Some manufacturers will argue: "What's the good of getting into the manufacture of paper substitutes which will have to be discarded after the War when plenty of the original standard product will be thrown on the market? Why make a weather-proof paper substitute for wire mosquito screening when metal screening will be available immediately after the War? Why make furniture and crutches of paper, hardened under great pressure, when plenty of wood will be available when the War ends"?

Dr. Karl T. Compton, president of Massachusetts Institute of Technology, answered such questions most succinctly a short time ago. As chairman of an advisory committee on scientific research, he affirmed:

"It is always important for industry to engage in research, but expansion of industrial research today, and in the months ahead, is imperative if America is to be assured of supremacy in national defense, and if it is to maintain and improve the American standard of living. . .

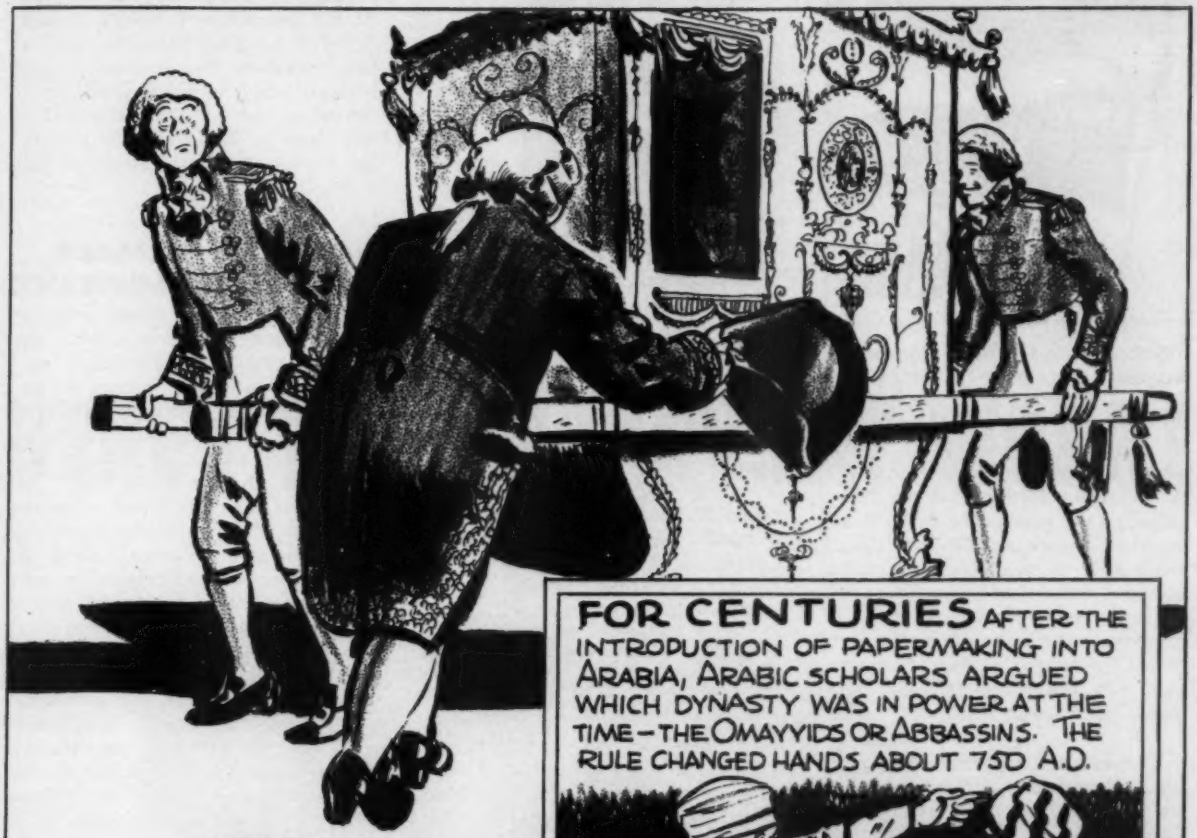
"By research today we can assure prosperity tomorrow. We can bring forth new goods, new services, new industries and new jobs, and do much to prevent the recurrence of economic dislocation such as that which followed 1917-1919 . . ."

It is not for the author to say what direction research activity in the pulp and paper industry should take. That is the job of men who have lived their lives in the industry and who, best of all, understand its weaknesses.

All that the author can hope to do is to point out the need of creating a situation whereby mention of pulp and paper immediately will stir a friendly interest in the minds of children, housewives, business men, industrialists and government officials everywhere—such as the unfailing (amused, though sometimes shocked) interest in Hollywood; the respectful (if often slightly skeptical) interest in insurance; and the general, sympathetic acquaintance on the part of the public with a number of other industries.

To achieve this useful end, the first step of the industry must be to develop an objective. A kind of research is required to make that determination. Then research of another kind may be necessary to create forward movement.

PAPER SKETCHES



IN THE 1770'S, HENRY CLAY OF ENGLAND, PAPIER MACHE MANUFACTURER, FURNISHED QUEEN CHARLOTTE'S SEDAN WITH PANELS OF RICHLY JAPANNED PAPIER MACHE.

FOR CENTURIES AFTER THE INTRODUCTION OF PAPERMAKING INTO ARABIA, ARABIC SCHOLARS ARGUED WHICH DYNASTY WAS IN POWER AT THE TIME – THE OMAYYIDS OR ABBASSINS. THE RULE CHANGED HANDS ABOUT 750 A.D.

THE FIRST VOLTAIC PILE BUILT BY ALESSANDRO VOLTA ABOUT 1800 WAS MADE OF ALTERNATE DISCS OF COPPER, ZINC AND MOIST PAPER, STACKED ONE ATOP THE OTHER IN A PILE.

IN DECEMBER 1942, PAPER BLANKETS WERE INTRODUCED TO NEW YORK CITY TRADE BY A FIFTH AVENUE DEPARTMENT STORE. THESE BLANKETS, SATEEN-BOUND AND IN A SIZE OF 68 X 80 INCHES, WERE MADE OF NUMEROUS LAYERS OF SOFT CREPE PAPER.

ALLIED

Babcock and Wilcox Company, Augusta, Georgia—The Army-Navy "E" was conferred upon the Augusta plant of this company on January 22. Rear Admiral Clark Howell Woodward, U. S. N. (retired), chief of the Incentive Division of the Navy presented the pennant to A. G. Pratt, president of the company, and Colonel Herbert W. Schmid, U. S. A., Commanding Officer of Camp Gordon, Georgia, presented the "E" pins to employees representing the plant personnel. Acting as master of ceremonies was Honorable W. D. Page, mayor of Augusta.

Chromium Corporation of America, Waterbury, Connecticut—In an impressive ceremony held at the Country Club of Waterbury on January 20, Lieutenant Colonel James A. Reilly of the Air Corps presented the Army-Navy "E" award to the Waterbury plant of Chromium Corporation. Ralph E. Cleveland, manager of the plant, accepted the award, and Dr. F. H. Hirschland, president of Chromium Corporation, congratulated the employees upon the production achievement. "E" pins were presented by Lieutenant John D. Lodge, U. S. N. R., to four of the employees, one of whom, Simon Semonian, made the speech of acceptance. Lieutenant Willis J. Goedert of the Air Corps acted as master of ceremonies.

Crane Company, Chicago—At a late afternoon ceremony on January 30, Admiral Clark Howell Woodward, U.S.N. (retired), presented the Army-Navy "E" pennant to this company. J. H. Collier, president, accepted the flag, and six representative employees, including plant veterans, accepted the lapel buttons from Colonel J. F. Butler, chief of the military personnel branch of the Army's 6th service command.

Foster Wheeler Corporation, New York City—The Carteret Works of this company recently was awarded the "Star" pennant, denoting excellence in production six months following the winning of the All Navy "E" award. The presentation ceremony was held in one of the big, new, construction shops during the noon hour. Captain B. H. Bruce, U. S. N., presented the pennant to President H. S. Brown, and "E" insignias were awarded to Mrs. Catherine Kimback and Joseph McClure as representatives of shop personnel by Lieutenant Commander William S. Downs. Senator John E. Toolan of New Jersey acted as master of ceremonies. Also participating were William Lonsdale, vice president in charge of manufacturing; Lieutenant J. Douglas Gessford, U. S. N. R., and Chief Gunners Mate George T. Lambert. The Minute Man Flag of the Treasury Department was also awarded at the ceremony.

Johns-Manville Corporation, New York City—Employees of the Kansas Ordnance Plant, built and operated by J-M Service Corporation, a Johns-Manville subsidiary, were awarded the Army-Navy "E" recently. At the ceremonies Lewis H. Brown, president of Johns-Manville declared that teamwork by government and business which is winning many battles of production under the lash of war could be just as effective in helping to win the peace after the war is won.

On snowy mornings, Dr. T. D. Yensen, of the Westinghouse Research Laboratories, avoids gas ration troubles by skiing two and a half miles to work. He is shown displaying his pass to a Westinghouse policeman at the entrance to the laboratories. Dr. Yensen is 58 years of age, and is a leader in the Western Pennsylvania Ski Patrol which has charge of policing the mountains and wooded areas in wartime. The Doctor is head of the Magnetic Department at the Westinghouse Laboratories.

◆

NEW BAG IS MADE OF CELLOPHANE

A highly efficient replacement for the varnishing tin can is a newly developed cylindrical fiberboard container into which is inserted a specially-constructed greaseproof cellophane bag. The mandrel used to insert the bag also folds back the film neatly over the rim of the box. The package is then filled and a printed cellophane disc is heat-sealed over the top. Finally, the fiberboard lid is put on and the package labeled. To open the package the housewife merely cuts the label around a dotted line, removes the cover and slits the cellophane drumhead with the point of a knife. This package was developed by a vegetable shortening packing company in Memphis, the Humko Company, in co-operation with the Du Pont Company's Cellophane Division and the Dobeckmun Company.

◆

▶▶▶ WYANDOTTE CHEMICALS CORPORATION, Wyandotte, Michigan, has recently been formed through the consolidation of Michigan Alkali Company and The J. B. Ford Company. Ownership, management, and personnel will remain the same.

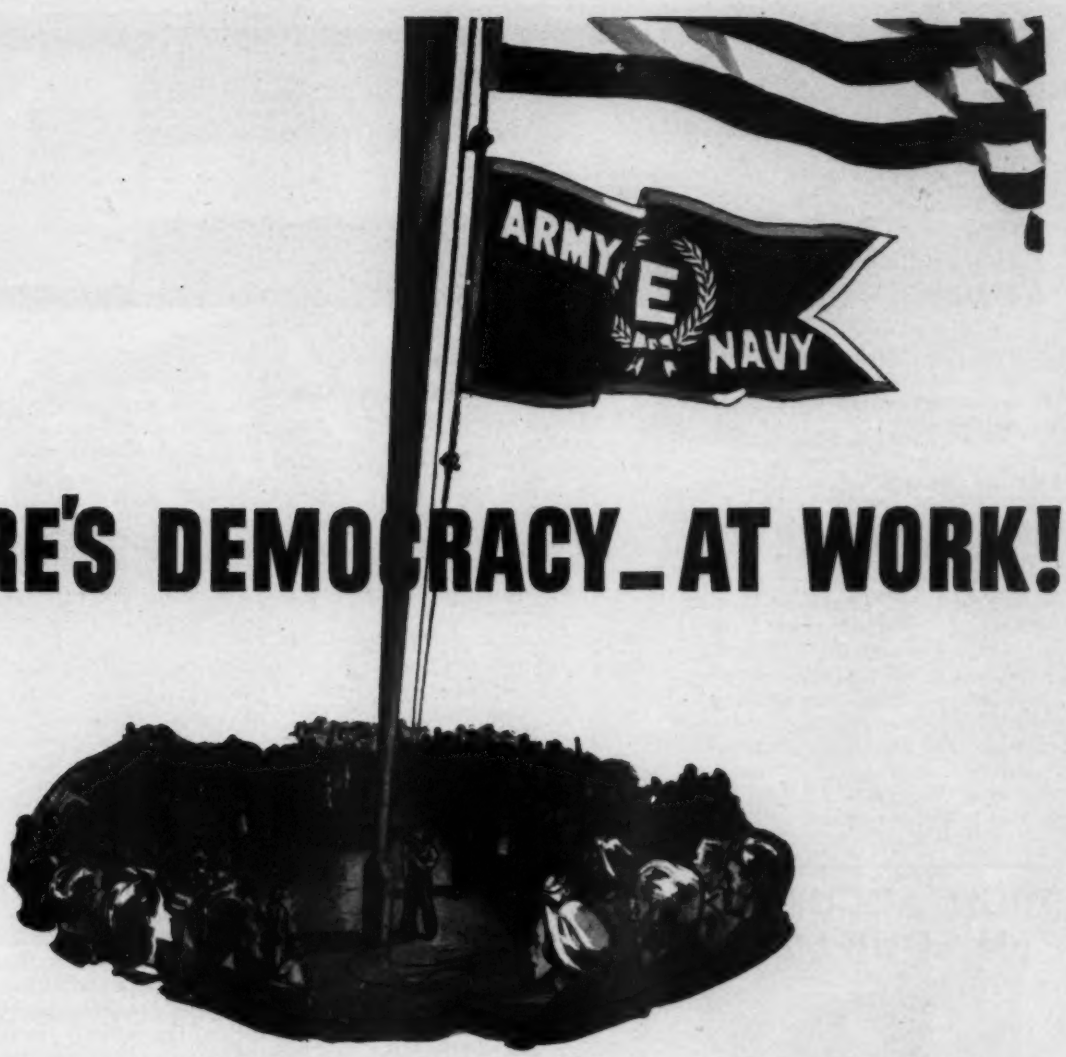
◆

BLACKMER PUMP CO. INTRODUCES NEW PUBLICATION

A new publication has been introduced by the Blackmer Pump Company, Grand Rapids, Michigan. *The Blackmer Swinging Vane*, which will be published periodically, is being distributed for the benefit of those who operate rotary pumps.

The introduction to the first issue, written by N. J. Harkness, executive vice president of the Blackmer Company, states that it is hoped the magazine will provide a medium through which the company may learn more of the pumping problems encountered and offer helpful suggestions toward their solution.

The magazine itself is a fine piece



HERE'S DEMOCRACY—AT WORK!

YES. We are proud of it—the coveted Army-Navy "E."

As it flies there under the symbol of democracy—those familiar stars and stripes—it does more, much more, than challenge us to outstrip yesterday's feats.

It is the signal flag of democracy *at work*.

For it is one thing to promise deliveries on vital chemicals to the services. Another to draw up production schedules. And yet another to deliver the goods.

That accomplishment belongs to the workers in our plants. That accomplishment is the living proof of democracy *at work*.

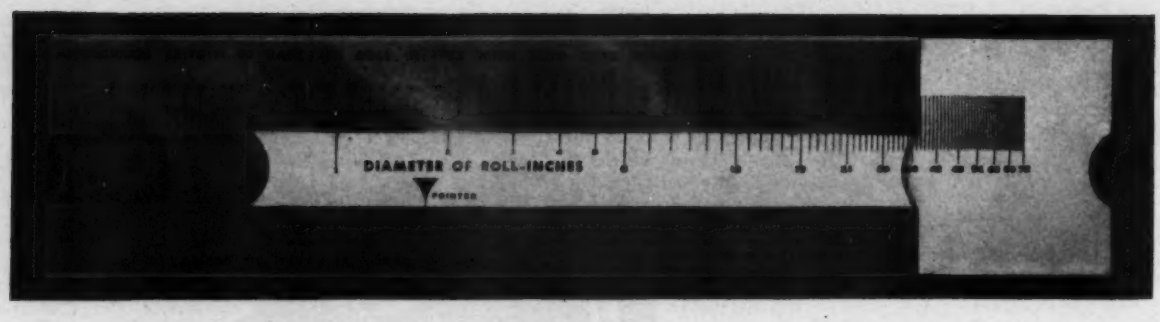
It is solid testimony to the good will, cooperation, and loyalty existing here between the workers, the supervisors and the management of Calco.

And it is our tribute to those of us who have left temporarily to serve in the armed forces.

CALCO CHEMICAL DIVISION
AMERICAN CYANAMID COMPANY
BOUND BROOK, NEW JERSEY

Calco

BOSTON • PHILADELPHIA • PROVIDENCE, R. I. • NEW YORK • CHARLOTTE, N. C. • CHICAGO



of work. It is well illustrated, and color is used liberally throughout. There are articles and much general information and data.

◆

▶▶▶ TO MAKE SURE THAT the hundreds of camps and scores of hotels in which troops are housed are efficiently heated with the greatest possible economy of fuel, the United States Army is sponsoring special training for a group of its combustion engineers. The selected staff of officers recently completed an intensive course of training at the school operated by the Brown Instrument Division of the Minneapolis-Honeywell Regulator Company. This school has also been training men from many ordnance and war plants in the use of industrial instruments.

HIGH ACCURACY pH EQUIPMENT

SINGLE and MULTI-POINT RECORDERS

Cambridge design insures accuracy and trouble-free performance to a degree hitherto unknown. The Multi-Point Recorder provides on one chart simultaneous records of pH at separate sampling points in the plant. Electrodes (glass) are housed in non-clog continuous-flow type chambers and may be installed wherever wanted. Cambridge is line operated.

CAMBRIDGE pH METERS ***(Laboratory and Industrial models)*** **provide continuous null indication. Sensitive to .005 pH, stable, rugged and portable. Operate from any convenient 110 volt AC outlet.**

Send for Bulletins

CAMBRIDGE INSTRUMENT CO., INC.
3732 Grand Central Terminal, New York, N. Y.

CAMBRIDGE
PRECISION INSTRUMENTS

ROLL LENGTH CALCULATOR

A handy roll length calculator has been developed by The Cameron Machine Company, Brooklyn, New York. This calculator is designed as an aid to paper mill superintendents, also operators of slitting and roll winding machines, as well as web fed processing machines in determining promptly the number of feet of paper or paperboard in a roll, when the diameter of the roll is known and the thickness or caliper of the web is checked in thousandths of an inch.

The calculator is arranged to enable determination of the length of paper in rolls of any diameter up to 17 inches, when the capiler of the paper is one half thousandth of an inch. As the caliper of the web increases, the scale permits determination of the length of paper in rolls of gradually increasing diameter. This calculator is available without charge to anyone in the industry writing to Cameron Machine Company on company letterhead. *(Illustrated above)*

◆

▶▶▶ JOSHUA HENDY IRON WORKS, of Sunnyvale, California, has recently acquired the Pomona Pump Company, of Pomona, California, and St. Louis, Missouri; its subsidiary Westco Division; and the Crocker-Wheeler Electric Manufacturing Company, Ampere, New Jersey. Joshua Hendy Iron Works was established in 1856, a little old plant originally built to turn out gold mining equipment, and has expanded to cover more than 60 acres of ground. The organization and its acquisitions are engaged in war production work.

◆

SALE OF STITCHERS TAKEN OVER BY ACME STEEL CO.

Users of Champion carton stitchers and parts were formally notified by Hoffert Machine Company, Inc., Racine, Wisconsin, January 26 that the distribution and sale of the Champion products had been taken over by Acme Steel Company, Chicago. Replacement parts will be readily available through Acme branches located from coast to coast. The Champion equipment also will be serviced by Acme.

Also announced were additions to the Acme Silverstitcher line of carton closure equipment which include top and seam stitcher as well as the present bottom, straight arm and combination.

◆

▶▶▶ A SIMPLIFIED Practice Recommendation for wire rope has been approved and will be effective February 15. This program lists sizes, constructions, grades, and breaking strength.

◆

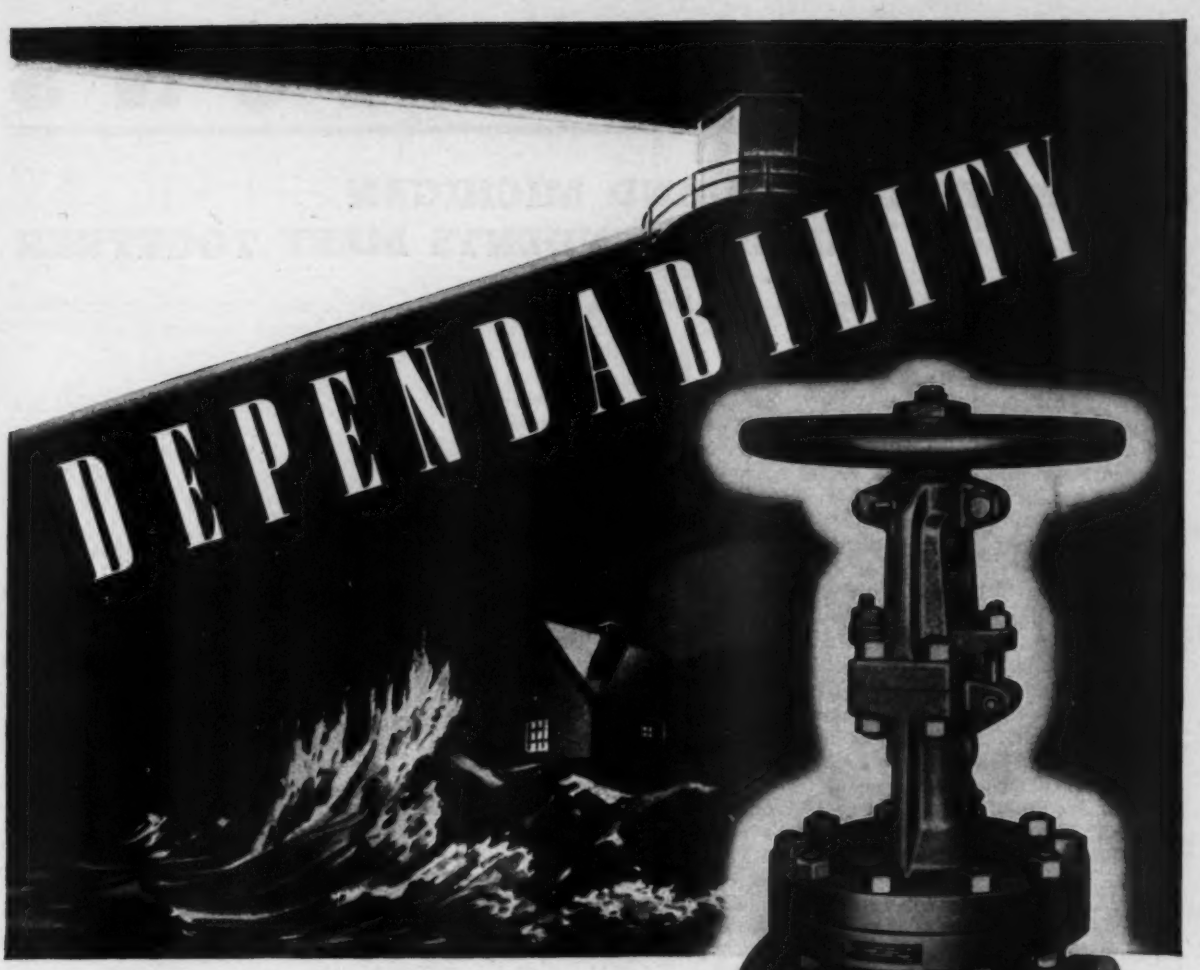
▶▶▶ THE MANHATTAN RUBBER Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, New Jersey, has a new 14-room hospital. It is staffed by a physician, five nurses, a secretary, and a clerk. Equipment is of the latest type and includes examining, treating, operating, and recovery facilities. The necessity for immediate and proper medical care for injuries and illness has long been recognized by this company, and it was the first industrial plant in the Passaic area to set up its own first aid hospital, in 1908.

◆

SERVICE AWARDS TO BE GIVEN BY STAND. OIL (IND.)

A total of 12,160 years of service will be recognized by Standard Oil Company of Indiana, Chicago, by presentation of gold pins to 668 employees during the first six months of 1943. Six employees will be awarded pins for 40 years of service each, 68 employees for 30 years, 394 employees for 20 years, and 200 employees for 10 years.

F. H. Fillingham, assistant general sales manager in charge of the eastern division, and W. T. Bannister, Minneapolis, Minnesota, division manager, are among the 68 employees serving the company for 30 years.



Throughout the Paper Industry, Powell Valves are famous for Dependability

It's not by accident that Powell Valves have an outstanding reputation for dependable performance in every operation of the Paper Industry.

There's a lot of truth in the trite old saying that "practice makes perfect." For nearly a century Powell has concentrated on making valves—*and nothing but valves*. And through the years Powell Engineering has always been on the job—meeting and satisfying every new demand for valve design and construction.

The Wm. Powell Company

Dependable Valves Since 1846

Cincinnati, Ohio

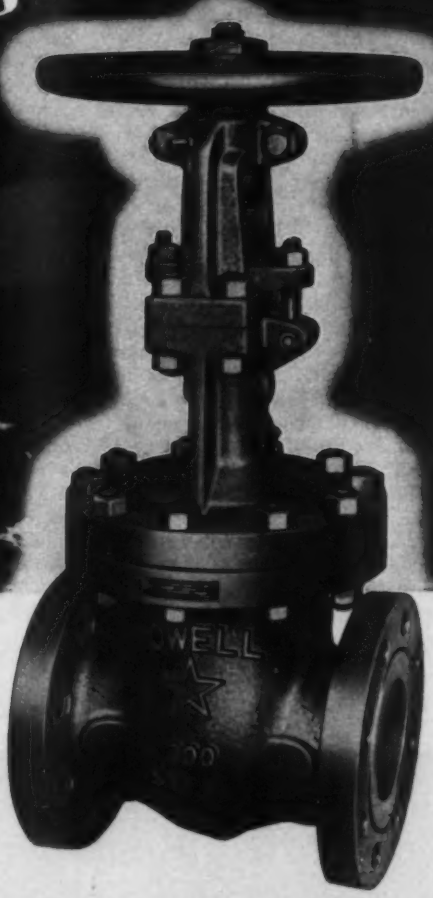


Fig. 3003—Class 300 pound Cast Steel Gate Valve. Has outside screw rising stem and two-piece bolted flanged yoke. Available in sizes from 1¼" to 24" inclusive, with either flanged or welding ends.

The complete Powell Line of Cast Steel Valves includes Globes, Angles, Checks, Gates, Non-returns, etc., for 150, 300, 400, 600, 900, 1500 and 2500 pounds W. P. to meet the demands of American Industry for dependable flow control equipment to handle ever increasing pressures and temperatures.

POWELL VALVES

ASSOCIATIONS

KALAMAZOO TAPPI AND MICHIGAN SUPERINTENDENTS MEET TOGETHER

▸▸▸ THE KALAMAZOO Valley Section of the Technical Association of the Pulp and Paper Industry and the Michigan division, American Pulp and Paper Mill Superintendents Association held their eighth annual joint dinner meeting at the Park American Hotel in Kalamazoo on January 7.

Approximately 325 paper mill officials, technical men, traffic managers, purchasing agents, superintendents, and representatives of the Allied Industrial Affiliates attended this very successful meeting. Among the special guests were: Ralph A. Hayward, president of KVP and national TAPPI president; Grover Keeth, national president of the Superintendents Association; and E. D. Hyndman, of the Anglo-Canadian Pulp and Paper Company, Quebec, and chairman of the Canadian Pulp and Paper Association's Technical Section. There were also a number of officers of both TAPPI and the Superintendents Association, and a representative number of the Allied Industrial Affiliates. Allan B. Milham, president of Bryant Paper Company, Kalamazoo, acted at toastmaster.

John G. Strange, president of the War Products Section of the WPB was to have been the guest speaker at this meeting, but he was unable to attend. However, he was represented at the meeting by his assistant, Herman Whitmore, who read the address Mr. Strange had prepared. This talk was really a review of the purposes of the War Products Development Section which is a part of the Pulp and Paper Division of WPB. The speaker drew a picture of the country's raw materials and dwelt upon the identity of so-called "critical" materials. In explaining the reasons which led to the formation of the War Products Development Section, the speaker said that it seemed a "clearing house" was necessary in order that this industry might more quickly and effectively orient itself to problems raised by our country's shortage of a host of important raw materials. This led to a discussion of the *unidentified opportunities* for paper to serve in the War. The complexities of the obscure applications of the industry's products needs clarification, and the speaker divided them into two projects which he termed "search projects" and "research projects." In the first mentioned project, effort was made to clarify the status of a given field or development. The projects involving the development of a paper or product to meet a new requirement were termed "research projects."

"Search Projects"

The new high strength paper base plastic laminates which have been given such wide publicity drew first mention in this group. It was stated that this project was sufficiently important that one man was assigned to devote three months full time to a study of the subject. It was stated that the survey in this field has been highly satisfactory and that all phases of the development are receiving aggressive attention in the several industries concerned.

Also mentioned in this group was the study that is being made of the impervious paper field. The study of this project has been co-ordinated with a survey in the field of dehydrated foods.

"Research Projects"

Three projects in this group were given special mention: strapping, bomb fins, and hand grenades.

The attention of the Section was drawn, with skepticism, to the possibility of substituting braided kraft twisting paper for steel strapping. After considerable experimenting, it

LEFT—Committee of Kalamazoo Valley paper men which supervised arrangements for the annual joint dinner meeting of Kalamazoo Valley Section of TAPPI and the Michigan Division of the Superintendents Association. Seated (L to R): Henry Nendorf, past chairman, Superintendents Ass'n; Fred Elliott, TAPPI chairman; Alfred Perlick, present chairman, Superintendents Ass'n; Fred Chappell, former chairman TAPPI. Standing (L to R): Ray Barton, national second vice president, Superintendents Ass'n; Rudolph Germanson, TAPPI treasurer; Joseph Waber, secretary-treasurer, Superintendents Ass'n; and Ed Taylor, TAPPI secretary. (All offices mentioned are of the local divisions, except where stated as "national".)

• RIGHT—Herman Whitmore (left), assistant chief of the War Products Development Section, Pulp and Paper Division, WPB, chats with Allan B. Milham, Bryant Paper Company, president and banquet toastmaster.

IMPROVED

WAX COATING

ECONOMY!

METHOCEL is currently making possible exceptional savings in paraffin wax coatings for moisture protection of boxes. It is used to prevent undue penetration of the paraffin into paper or board, and makes possible the desired amount of moisture protection with substantially less paraffin.

With paraffin becoming more difficult to obtain, this becomes an important consideration. Further, the use of METHOCEL prevents mottling of the package due to varying pick-up of the paraffin by the stock. As a result, package appearance is greatly improved. METHOCEL is also used for gloss ink sizing, affording ink economy through decreased penetration of the vehicle.

Your inquiries on METHOCEL are invited.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

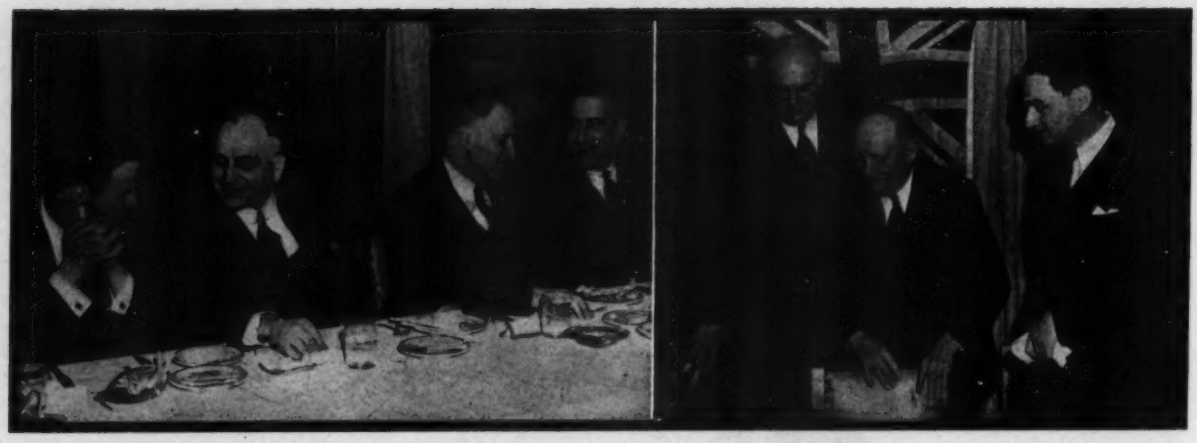
New York, St. Louis, Chicago, Houston, San Francisco, Los Angeles, Seattle

METHOCEL

(DOW METHYLCELLULOSE)

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY



LEFT—During the banquet, paper production and technical matters were the main topics under discussion. Left to right: Fred Elliott, chairman Kalamazoo Valley Section of TAPPI; Ralph A. Hayward, president KVP and national TAPPI president; R. G. Macdonald, national TAPPI secretary; and E. D. Hyndman, chairman of the Technical Section Canadian Pulp and Paper Association.

• RIGHT—Taking places at the speakers table are: (L to R) Fred Chappell, former chairman Kalamazoo Valley Section of TAPPI; Bernard ("Barney") Benson, vice president, Williams-Gray Company, Chicago; and Maxwell Bardeen, president of Lee Paper Company, Vicksburg, Mich.

appeared that certain strapping applications might well be served by paper. Among the variables to be considered were whether paper strapping could be handled adequately in tension tools; also, the question arose as to whether the paper strapping would relax or lose its grip under pressure. However, it has been found that paper makes a fairly satisfactory strapping for certain purposes, among which might be mentioned the baling of clothing for the Army, the baling of waste materials, even perhaps the baling of cotton.

In speaking of the development that has been made in perfecting hand grenades, it was stated that the objective—an entire grenade made of fiber—has been accomplished. The possibility of making certain incendiary bomb fins from fiber is still in process of perfection, but this project is receiving the co-operation of certain groups which will unquestionably work out the proper technique.

Also mentioned in this group were wet strength papers, overseas shipping containers, and special types of papers.

The speaker left the thought that the Section is convinced there are many untapped opportunities for paper to serve in the war effort. He made it clear that the success of many of these developments depends upon the industry itself—that the Section should be considered only a clearing house between the industry and the official agencies.

ANNUAL MEETING OF CANADIAN PULP AND PAPER ASSOCIATION

▶▶▶ THE ANNUAL MEETING of the Technical Section of the Canadian Pulp and Paper Association was held at the Mount Royal Hotel in Montreal, Quebec, January 27-29. With wartime regulations paramount, the keynote of this meeting was "Conservation and Waste Elimination."

Two sessions were held simultaneously on the morning of the first day and similar sessions were continued after lunch throughout the afternoon. A number of formal papers were read at these meetings. The subjects were timely and each one exhibited a careful study of all phases of the subject.

The morning of the second day scheduled sessions which were devoted to group discussions. These sessions, as always, evoked general participation and much valuable information went into the proceedings. The afternoon of the second day was given over to an open forum for the discussion of "Conservation and Substitution of Critical Materials." Nine members of the Technical Section formed the panel for this session and the discussions were off the record.

The last day of the meeting was devoted to group discussions under the auspices of the Section's committees. One special group discussion was held as a joint meeting of the Printability and Newsprint Committees for a discussion of their problems. Another joint meeting was that of the Sulphite - Groundwood - Newsprint Committees which discussed the problem of wood and its effect on quality.

One interesting feature of the meeting was the exhibit of work done by the machine shops of the industry through the Canadian Pulp and Paper Association Wartime Machine Shop Board. This exhibit was open during the three days of the meeting.

Following are highlights of some of the papers presented:

Groundwood Stock Blending

E. Overstrom, Gulf Pulp and Paper Co.—Board pulp of varying freeness, as required, can very successfully be turned out by blending the accepted stock from the second screens with a certain percentage of pulp from the first screens. Bulk of first screen stock is made into catalogue, tissue or newspulp. Pulp of increased freeness through blending does not only give higher tear strength but also higher burst strength. Vastly different grades of pulp can be produced with practically no change of stone pattern.

The Substitution of Birch for Spruce-Balsam Groundwood in the Newsprint Furnish

W. W. Holland, groundwood superintendent, Quebec North Shore Paper Co.—Birch wood with an average density of 0.495 and moisture content of 28.5 per cent produced groundwood pulps with mullen

"BUT" HE SAID, "WHY SHOULD I PAY A PREMIUM FOR Z-METAL?"

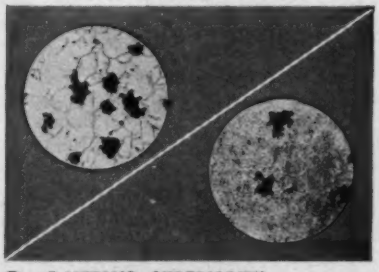
*THE REX MAN

...AND THIS IS WHAT I* TOLD HIM...

① **"MAYBE Z-METAL** chain belts last longer," this superintendent said. "But is this worth the premium that you are asking me to pay? Sure, I want all the durability I can get, because breakdowns these days are more than a nuisance."

② **"BELIEVE ME,** if they cost twice as much, they would still be worth it! They not only last a *little* longer than ordinary chain belts—they last a *whale of a lot longer!* They're not only a little stronger *—they're over 25% stronger!"*

③ **"NOT ONLY THAT,** Z-metal chain belts offer you practical immunity against moist conditions. These three factors of greater strength, much longer life, and resistance to corrosion mean a far greater return on your investment."



④ **"Z-METAL'S SUPERIORITY** is fact, as these micrographs show. Above is the structure of good malleable iron; below is that of Z-metal. When you think that Z-metal only costs you a little more, you'll marvel at their longer service."

⑤ **"Z-METAL CHAIN BELTS** can replace conveyors like these on the same sprockets without any expensive changes, and better than double their life. They've done it for many other mills, and I am sure they can do it for yours."

⑥ **"WELL, I BELIEVE** you've sold me," he said. "After all, if I can get that kind of durability for just a little more money my figures show that a Z-metal chain belt can pay for itself in a hurry through eliminating frequent delays and repairs."

Z-metal chain belts are hard at work these days in lumber and pulp mills the country over. They've answered a variety of problems for others; they can do the same for you. Naturally, orders bearing highest priority distinction take precedence. Chain Belt Company, 1717 W. Bruce Street, Milwaukee, Wisconsin.

REX CHAIN BELTS

CHAIN BELT COMPANY OF MILWAUKEE

Baldwin-Duckworth Chain Belt Division, Springfield, Massachusetts • Worcester, Massachusetts
Rex Chain Belt and Conveyor Divisions, Milwaukee, Wisconsin

REX CHAIN BELT COMPANY

strengths 10 per cent of normal for spruce and tear values 15 per cent of normal with a bulk increase of 45 per cent. Paper machine trials with birch groundwood at 4 per cent of the mixed furnish indicated that mullen and tensile strengths and paper smoothness were lowered, while bulk increased. Machine efficiency dropped slightly, and sewer losses increased through higher return water consistencies. There was no measurable improvement in opacity of the news sheet and it was less bright than with our normal furnish. This paper operated well on the printing presses, but it was considered inferior to our regular paper from the point of smoothness, transparency and the actual printing. A laboratory project supplied data which showed that the detrimental effect of these particular birch groundwoods, in varying percentages of the mixed furnish, was rather more than in direct proportion to the percentage of birch in the furnish.

Most Pleasing White Papers from Unbleached Sulphite Pulps

A. K. Ames, Canadian Industries Ltd.—Spectrophotometric analysis of the reflecting properties of five unbleached sulphite pulps show that they all give low reflectance in the blue end of the spectrum rising gradually to a very high reflectance at the red end of the spectrum. To obtain a white looking sheet the color balance must be adjusted until a straight or approximately straight line is obtained. The addition of increasing amounts of pigments and bleaching agents produces a rise in brightness, which can be evaluated by the brightness tester, and which depends on retention by the pulp. Fluorescent materials and scouring give an increase in brightness to unbleached sulphite pulp and a number of these have been tried.

The Reddening of Unbleached Sulphite Pulp

A. K. Ames, Canadian Industries Ltd.—No inquiry into the constitution of the impurities in unbleached sulphite pulp could be undertaken so it was assumed that these impurities responsible for the change in color of the pulp were easily oxidizable substances, probably sulphonic acids with perhaps some degree of unsaturation in their molecule. On oxidation due to presence of air the impurity changed from a colorless compound to a colored one. It was noticed that ferric iron accelerated the change while Ferrous iron had little or no effect. Ultra violet light also acted as a catalyst. Efforts to form stable addition compounds with the unstable ingredient in the pulp met with little success but the addition of stable reducing agents appeared to offer some advantage. Attempts to wash out the impurities using various agents were relatively unsuccessful, while the use of oxidizable dyes, easily oxidizable compounds, etc., showed little sign of improvement. Stable reducing agents at present seem to be the only helpful compounds and these do not prevent reddening, only retard it.

Some Observations on Pulpwood Types and Their Preparation in Relation to Pulp Cleanliness

L. J. Rioux, sulphite mill superintendent; Marcel Barsalou, assistant chemist, Fraser Companies, Ltd.—Because wood is becoming a scarcer and more expensive raw material, every possible means should be used to reduce wood preparation losses and still meet pulp dirt standards. Extraneous dirt and dirt found inside the wood should not occasion the loss of any wood: while the proper use of the sulphite mill variables should make it possible to produce clean pulp without excessive wood losses because of the presence of bark and staining on the wood. It is suggested that only after all possible variables in the sulphite mill have been used to best advantage to reduce pulp dirt, should one go back to the woodroom and more intense wood cleaning, to obtain further dirt reductions.

Accidents—Our Greatest Waste

A. E. H. Fair, manager, Cornwall Division, Howard Smith Paper Mills Ltd.—A plan of training of the employee from time of employment to make him safety conscious and to teach him safe methods is essential to the success of any safety program. The foreman is the chief instructor. The new employee is questioned about his knowledge of hazards after he has been employed for a short period.

Accident causes are classified as:

a) Physical or mechanical
b) Mental or abstract
c) Unavoidable

The permanent accident prevention program includes:

1) A thorough scheme of organization, comprising:

a) A safety committee with complete employee representation.

b) Regular inspection and report by employees' committee.

c) Personal appearance at the monthly meeting of the safety committee of the victims of accidents who describe their own accidents and suggest means to avoid them.

d) Classification of accidents for purpose of record on employees' conduct cards.

2) Continuous appeal to employees in the form of the usual posters, etc. This is augmented by weekly safety suggestions attached to the pay checks —to impress continually upon the employees the importance of safe working. First Aid training is a most effective means of making employees "safety conscious."

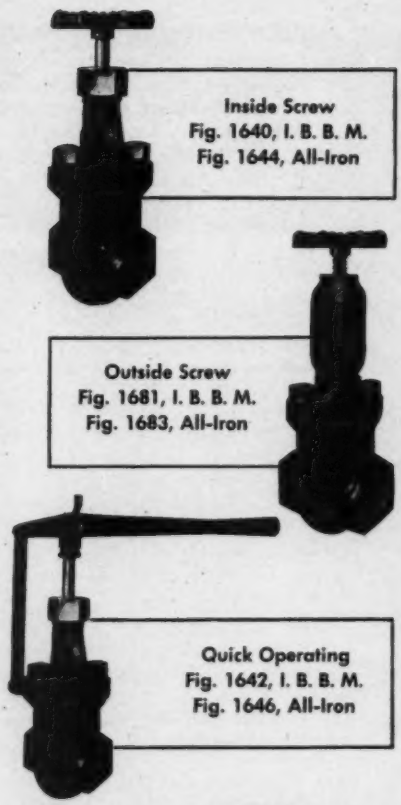
3) Incentives are important in accident prevention. Safety competitions and suggestion boxes are effective. The method of operating these determines their value. Results of competitions must be displayed in an attractive manner. The service of the Industry Safety organization and its safety engineer should be fully utilized. Technical men generally have a definite place in the accident prevention program. They should give leadership and show an example to other employees. Engineers should design "safety" into equipment. Engineers should insist upon safe design of machines.

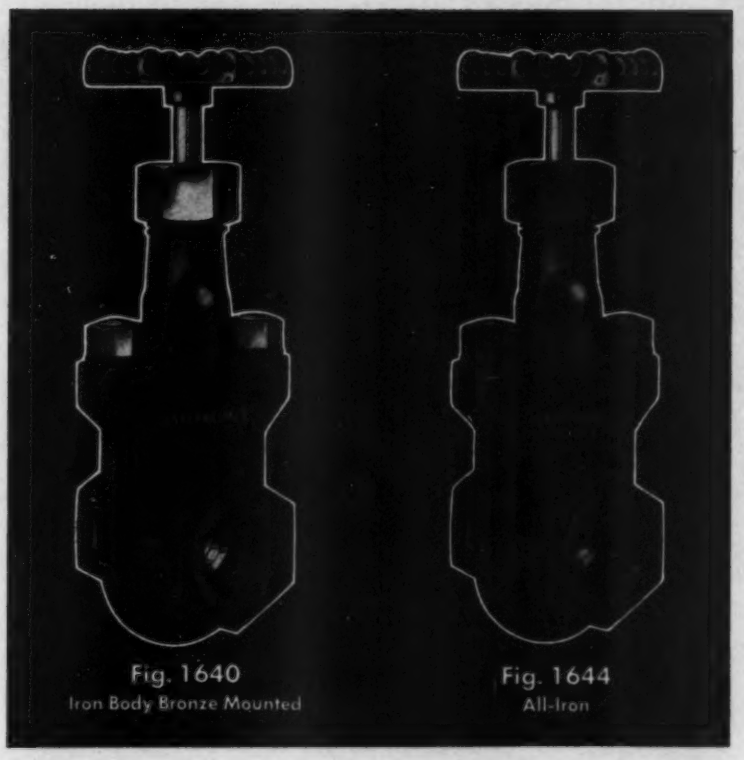
Plastics and the Paper Industry

Dr. R. V. V. Nicholls, assistant professor of chemistry, McGill University—All organic plastics, rubbers, fibers, coatings, and adhesives may be classed as "high polymers," that is, they all contain long molecules. Wood is an excellent natural source of these long molecules. From the cellulose come such versatile derivatives as regenerated cellulose, cellulose esters, and cellulose ethers; from the hemicelluloses come alcohol for synthetic rubber and furfural for plastics; from the lignin come plastics and adhesives; from the rosin come plastics, adhesives, coatings, and rubber-compounding agents; and from the essential oils comes isoprene for Butyl rubber. The paper industry serves the plastics industry in supplying fillers for molding compounds and papers for laminates. The plastics industry serves the paper industry in supplying materials, when applied to paper confer upon it special properties, such as greaseproofness, water-vaporproofness, water repellency, high wet strength. In recent years plastics have been used more and more in paper mills as laminates and coatings, and for piping and adhesives.

A Study of Stock Preparation in Paperboard Mills

W. H. De Montmorency, boardmill superintendent, Gair Company, Canada, Ltd.—Upon full plant scale experiments, performed in triplicate, are based the following conclusions:





Every Minute Saved in Maintenance . . . Means More Productive Hours

And these husky "King-clip" valves are doing just that... saving those precious minutes that add up to more productive time. With "King-clips" on the job, maintenance is cut to a minimum . . . users are assured of a practically permanent installation, free from the hundred-and-one "valve headaches".

"King-clip" Valves are doing their part in another respect, too . . . in conserving critical materials. Since only working parts are made of bronze, these iron body valves use less copper, tin and other scarce materials than all-bronze valves, at the same time performing equally as well on many services.

And here's an important point . . . you are likely to get better deliveries on "King-clips" than on the scarcer all-bronze valves. The complete facilities of Lunkenheimer distributors are at your service. They'll go all out to help you get the things you need.

Since virtually all materials used in the manufacture of valves are on the list of critical materials, valve users are urged to furnish the highest possible preference ratings and proper "end use" information on their orders. This will be of mutual helpfulness.

ESTABLISHED 1862
NEW YORK BOSTON **THE LUNKENHEIMER CO.** CHICAGO PHILADELPHIA
"QUALITY"
CINCINNATI, OHIO, U.S.A.
EXPORT DEPT., 318-322 HUDSON ST., NEW YORK

BRONZE, IRON AND STEEL VALVES, 125 TO 2500 LB. S.P. FOR ALL INDUSTRIES; BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS

1) The Hollander type beater commonly employed in board mills is not a very efficient pulping machine when operated with the roll well above the bed plate, nor is it particularly effective in developing the latent strength of stock when the roll is put down for the length of time permissible in board mills.

2) Impeller type pulpers are more efficient than are beaters in pulping the stocks studied.

3) The refiners studied act as pulping agents almost altogether, being unable to carry the development of stocks beyond the point obtained by thorough pulping when operated at capacities necessary to modern board mill practice. They are quite capable of producing a greater development of the properties of such stocks if operated at capacities very much below those required.

4) The refiners studied are very efficient pulpers when operated in conjunction with other primary pulping devices. They may be evaluated on the basis of their pulping ability.

5) Jordans are essential components of any board mill stock preparation system. The characteristics of any stock in the vat are dependent almost altogether upon the jordanning which the stock received.

6) Stock preparation systems commonly employed in the production of top liner stock in board mills are capable of developing 60 per cent to 75 per cent of the potential strength of the stock as determined by the TAPPI Beater Test.

Instrumentation in Kraft Pulp Mills

A. J. Philip, resident manager, Canada Paper Co.—Automatic control is not claimed to be a panacea for all the troubles encountered in a kraft pulp mill but it is the belief of this committee, based on actual experience that automatic controls have a definite value in maintaining uniformly high quality, improving all around efficiency, and in the saving of material.

Sulphite Blow Heat and Gas Recovery

J. N. Swartz, chemical engineer, Cornwall Division, Howard Smith Paper Mills, Ltd.—In the system described, two stages are employed. For the first stage the steam is condensed during the blow in a jet condenser, under such conditions that the condensing water leaves the condenser at a temperature of approximately 190 Fahr. and then passes to the top of a hot water accumulator. The hot SO_2—contaminated water, intermittently collected in the top of the accumulator is continuously drawn away and passed through a heat exchanger, the cooled water being returned to the bottom of the accumulator. The cooled water collected in this way provides the condensing water which is returned to the jet condenser at the next blow. Cold fresh water enters the heat exchanger at 60 Fahr. (average) and leaves at 150 Fahr. Since the water used for condensing purposes is employed in a closed system, and consequently is saturated with SO_2, the SO_2 in the blow steam is essentially not absorbed, but passes on to the second stage, or the SO_2 accumulator system. During the blow, the water contained in this second accumulator is recirculated through an ejector, the cooled SO_2 gas being absorbed in the water and used for make-up water in the Jenssen towers. Actual operating figures for a 10.7 ton digester (chip packing) show a recovery of about 13,000 lb. of steam and 350 lb. sulphur per blow.

Election of Officers

E. Howard Smith, who has been president of the Canadian Pulp and Paper Association since R. L. Weldon was named newsprint administrator four months ago, was re-elected president of the Association. The following vice presidents were named: F. G. Robinson, International Paper Company, Ltd.; C. R. Whitehead, Consolidated Paper Corporation, Ltd., and R. L. Weldon, Bathurst Power and Paper Company, Ltd. (The latter is on leave of absence.)

The Technical Section ot the Association elected H. D. Hyman, general manager of J. R. Booth, Limited, as chairman. W. G. Wright, of Price Brothers, was re-elected chairman of the Woodlands Section.

At the Association luncheon meeting on the second day, J. N. Stephenson, editor of *Pulp and Paper Magazine of Canada,* announced that the trophy for the safest mill in Canada among the big plants had been won by the Liverpool, N. S., mill of Mersey Paper Company, while the trophy for smaller mills had been awarded to Lotbiniere Pulp & Paper Company which had a perfect record of no accidents during the year.

◆

CONVENTIONS AND COMING EVENTS

February 15-18 — Annual meeting of the Technical Association of the Pulp and Paper Industry at the Commodore Hotel, New York City.

February 15-19 — "Paper Week" annual meetings of American Paper and Pulp Association and affiliated bodies at the Waldorf-Astoria Hotel, New York City.

May 16-19 — National Paper Box Manufacturers Association Silver Anniversary Convention, The Drake Hotel, Chicago.

June 15-17 — National Convention of the American Pulp and Paper Mill Superintendents Association, Commodore Hotel, New York City.

STATED MEETINGS

Technical Association of the Pulp and Paper Industry.

Delaware Valley Section—First Friday of each month—Engineers' Club, Philadelphia.

Kalamazoo Valley Section — First Thursday of each month—Park American Hotel, Kalamazoo, Mich.

Lake States Section—Second Tuesday of each month—Conway Hotel, Appleton, Wis.

New England Section — Regular meetings of this group have geen discontinued. The next meeting will be held in March.

The American Pulp and Paper Mill Superintendents Association, Inc.

Michigan Division — Third Thursday of each month—Park American Hotel, Kalamazoo, Mich.

◆

PACIFIC SECTION TAPPI MEETS AT LONGVIEW

Principal speakers before the midwinter meeting of the Pacific Section of TAPPI held at Hotel Monticello, Longview, Washington, were R. H. Williams, specialist of training within the industrial division of the War Manpower Commission, and O. T. Defieux, superintendent of the steam plant at the Crown-Zellerbach plant at Camas, Washington.

Mr. Williams discussed "Where Job Instruction Training Fits into the Induction Procedure," stressing the importance of planned job instruction, especially now when the time is so short for fitting men for important jobs. Mr. Defieux's topic was "Conservation of Critical Materials." He stated that it is the duty of pulp and paper companies to discuss conservation plans with their foremen so that everyone understands the importance of conservation and the best methods of carrying out the conservation program. E. Lyons, of the pulp division of Weyerhaeuser Timber Company, explained some of the ways in which his company is meeting shortages in critical materials.

E. Wood, technical director of the Weyerhaeuser pulp division, was chairman of the meeting.

How to Get Better Process Water

You Can Have The Many Modern NORWOOD ADVANTAGES BUILT INTO YOUR FILTERS

This typical filter installation has been completely rebuilt with Norwood equipment.

IN these days when it is important to keep your filtration equipment in good condition, you will find it well worth while to investigate the possibilities of having the many modern Norwood Advantages built into your present filters.

Send For Engineering Data Units

We have helpful Engineering Data Units covering Norwood Equipment. Send for your set today.

Filters: Ask for Portfolio F for a complete set of data units on Norwood Water Filters.

Calenders: Ask for Portfolio C for a complete set of data units on Norwood Calenders.

Norwood Filters are designed and built on the basis of knowledge gained in nearly half a century of working with paper mill process water problems. All of the advantages of these efficient filters can be built into your present filters.

Check your filters now . . . so you may plan to keep them operating at top efficiency for the duration. If you need new sand or gravel, a new manifold system or new strainers, or other repairs or replacements . . . now is the time to order them. And if you need a complete rebuilding job . . . bringing your filters up to date with the many Norwood advantages . . . now is the time to place your order.

Shipments can't be made "as usual," but we will gladly discuss just what can be done to keep your filters running or bring them up to date. Write us about your process water problems today.

Get a Good Start And a Good Finish With

NORWOOD

WATER FILTERS AND PAPER FINISHING MACHINERY

The Norwood Engineering Company

16 No. Maple St., Florence, Mass.

The Palmetto ABC Chart of Packing Service Recommendations is yours for the asking.

TO ALL ENGINEERS

Do you know all the services on which you can use PALMETTO the many-purpose packing?

For example . . .

• APPARATUS

All valves	Boiler feed pumps
Steam engines	Expansion joints
Turbines	Air compressors
Stokers	Condensate pumps
Soot blowers	Vacuum pumps

• FLUIDS

Steam	Mild alkalis
Hot water	Gritty water
Air	Gases
Mild acids	

FREE WORKING SAMPLE

Just send us your name and address, stating size and operating conditions for packing, and a generous sample will be sent you without charge or obligation.

WRITE FOR LITERATURE

GREENE, TWEED & COMPANY

Bruce Blvd. at 238th St., New York, N. Y.

TWISTED

For valve stems; each strand a perfect piece of lubricated packing.

BRAIDED

For rods and shafts; layer over layer construction insures uniformly even bearing surfaces.

PALMETTO

for steam, hot water, air. PALCO for water. PELRO for oils. CUTNO for alkalis. SUPERCUTNO (blue asbestos) for acids. KLERO for foods.

SELF-LUBRICATING PACKINGS

SAFETY

GLATFELTER CO. HOLDS ANNUAL SAFETY MEETING

The Fourth Annual Community and Industrial Safety Meeting sponsored by the P. H. Glatfelter Company, Spring Grove, Pennsylvania, was held January 5. Seven hundred people, employees of the company, their families and friends attended this annual event, which was inaugurated as a part of a plan for developing greater safety and safety-mindedness among the employees of the plant and in the home.

P. H. Glatfelter, president, presided, and used as the main theme of his address that health and safety are not only of great value to a local community, but have a far reaching effect when considered as a vital part in the maintenance of production so necessary to the war effort. He also paid tribute to the 44 former employees of the company now serving in the Armed Forces. Other speakers were Henry D. Schmidt, president of Schmidt and Ault Paper Company, York, Pennsylvania, and director of the York County Defense Council, and Edwin C. Resser, chairman of the York County War Savings Staff. Prizes were awarded employees who had had no lost-time accidents during the fourth quarter and for the entire year, names being drawn from all those in each department that had such records.

◆

▶▶▶ THE CARTON SHIPPING DEPARTMENT of the Marathon Paper Mills Company, Menasha, Wisconsin, recently celebrated the completion of another year—the fourth—without a lost-time accident. At the celebration, H. Aderhold, of the personnel department, congratulated A. L. Baenke, supervisor, and the men in the department. A film, "Handle with Care," showing proper methods of lifting and moving heavy objects, was shown, as well as three shorts of fishing, trick bowling, and the American invasion of Africa.

The Paper Industry Safety Scores

July 1, 1942 to June 30, 1943

Out of 197 mills reporting for December, 14 have perfect record

PERFECT SCORES
Division I—Pulp and Paper Mills

PARTICIPANT	MILL	LOCATION
GROUP A		
GROUP B		
GROUP C		
Price Brothers & Co., Ltd.	Jonquiere	Quebec, Canada
American Writing Paper Corp.	Riverside #2	Holyoke, Mass.
GROUP D		
U. S. Gypsum Co.	Board Mill	Lisbon Falls, Me.
Marathon Paper Mills Co.	Ashland	Wisconsin
American Writing Paper Corp.	Crocker Div.	Holyoke, Mass.
*Spaulding Fibre Co., Inc.	Milton	New Hampshire
American Writing Paper Corp.	Mt. Tom Div.	Holyoke, Mass.
Union Bag & Paper Corp.	Allen Paper Mill	Hudson Falls, N. Y.
International Paper Co.	Riley #23	Riley, Me.

Division II—Paper and Board Re-Manufacturing

Marathon Paper Mills Co.	Wausau	Wisconsin
*Fort Orange Paper Co.	Paper Box Plant	Castleton on Hudson, N. Y.
Thilmany Pulp & Paper Co.	Bag Mill	Kaukauna, Wis.
South West Box Co.	Sand Springs	Oklahoma
Bay West Paper Co.	Green Bay	Wisconsin

*December report missing—covers five months only.

What every plant operator should know about GLASS PIPING!

Q: Is GLASS PIPING available now?

A: Yes!

Glass-making materials are still fairly plentiful. And many plant operators are discovering that PYREX Brand Piping not only solves piping shortage problems but also, in many cases, does a better job than the piping they formerly used.

We do need priority ratings that enable us to get accessories (flanges, gaskets), to assign necessary labor, and to establish the position of your order in our production line. With such priorities we have been making 6 to 8-week deliveries.

Available sizes and lengths: 1", 1¼", 2", 3", and 4" diameters—and any length from 6 inches to 10 feet (longer lengths on special request). There are corresponding ells, tees, return bends, and reducers.

Accessories: Joints are compression type—with conical pipe ends compressed to a self-centering gasket by metal flanges and clamping bolts. We supply gaskets of materials suited to the liquid or gas you want to convey.

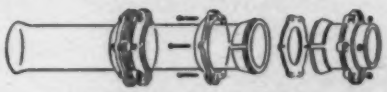
WHERE DOES IT GIVE BEST SERVICE?

Wherever hot or corrosive liquids or gases must be conveyed . . . wherever products must be protected from contamination . . . wherever it is important to know what is happening *inside* a line . . . there PYREX Piping gives you its most profitable service.

Chemical plants use it to eliminate their corrosion problems, because it resists all hot or cold acids (except HF). Food and beverage manufacturers like it because it's easy to keep clean, either by simple flushing or with steam or strong hot cleaning solutions. It helps to produce a purer product.

WATCH FOR CORNING ADVERTISEMENTS!

Watch this magazine for more information in Corning's advertisements headed "What every plant operator should know about Glass Piping." And write for PYREX Piping Bulletin No. 814. Industrial Division, Corning Glass Works, Corning, N. Y. Branch Offices: New York, 718 Fifth Ave.; Chicago, Merchandise Mart.



IS IT EASY TO INSTALL?

Plant workmen have found it easy to make installations themselves. In fact, green plant mechanics have recently done first-rate installations with PYREX Piping.

You may install from one piece to a whole system—for PYREX Piping may be joined to existing metal lines and equipment. And it is hung and supported much like other types of piping. (See photo at top of page.) We do recommend that hangers and supports be padded, to minimize scratching.

WILL IT STAND UP MECHANICALLY?

Yes. PYREX Piping is recommended for working pressures up to 100 p.s.i. But glass in this form is *not* as strong as metal. So, care must be taken to avoid installation strains or sharp impact. Nearly 20 years of service under all kinds of plant conditions have proved that only simple common sense and reasonable care are required to handle PYREX Piping without trouble. The glass itself, incidentally, is very hard—about twice as resistant to abrasion as ordinary plate glass. Thus, the piping is particularly suitable for abrasive, corrosive slurries. You can install and use PYREX Piping with confidence.

WHAT DOES IT COST?

The initial cost of PYREX Piping (accessories included) is about the same or less than the cost of full-weight copper or brass piping, in comparable sizes, and is considerably less than the cost of stainless steel.

And because PYREX Piping does not wear out under acid attack, it gives long trouble-free service, with resultant low long-time cost.

The left-hand photograph at the top of the page is an example. That PYREX Piping has carried a slurry of crushed quartz and sulphuric acid for over eight years—without one cent of maintenance.

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

CORNING
Glass Works
Corning, New York

Pyrex Industrial Glass

NAMES *in the* NEWS

Personals

DR. JAHN WILL STUDY SWEDISH PULP PROCESSES

Dr. Edwin C. Jahn, Department of Pulp and Paper Manufacture, New York State College of Forestry, Syracuse University, has been granted leave to study the war uses of pulp and wood in Sweden, according to an announcement by Professor Clarence E. Libby, head of the Pulp and Paper division of the College. Professor Libby states that in Sweden many new developments have recently been made in pulping processes and in the utilization of wood. Recently the manufacture of synthetic rubber from wood was reported.

He also states that three organizations are interested in this study: the United States Department of Agriculture, the New York State College of Forestry and the Technical Association of the Pulp and Paper Industry. Dr. Jahn has a temporary appointment to the Research Division of the Department of Agriculture for the period of his leave from the College of Forestry.

Dr. Sydney Coppick has been appointed to Dr. Jahn's position. Dr. Coppick is a graduate of McGill University in chemical engineering. Later he received the degree of Master of Science from the University of Idaho and Doctor of Philosophy from the New York State College of Forestry. He has had industrial experience in the pulp, fiber board and rayon industries and comes to the College from the University of Texas, where he was doing research in cotton chemistry.

◆

▸▸▸ Vice president and general manager of the Newton Paper Company of Holyoke, Massachusetts, *James N. Logan* has been appointed director of industrial metal salvage for the mills of Holyoke.

◆

▸▸▸ Announcement was made recently of the appointment of *Hugh Strange*, of the John Strange Paper Company, Menasha, Wisconsin, to the Paperboard Industry Advisory Committee of the War Production Board.

▸▸▸ After almost a year in office, *Norman E. Wainwright* has resigned as Administrator of Converted Paper Products in Canada. His resignation is to become effective as soon as a successor, as yet unnamed, can be appointed to take over the office. Mr. Wainwright has spent practically all his business life in the paper trade. Before taking over control of the Toronto Envelope Company a few months ago, he was sales manager of Port Arthur, sales and export division of Provincial Paper Ltd., president of Don Valley Paper Mills, and president of Buntin-Gillies Company.

◆

▸▸▸ Technical advisor to the Union Bag and Paper Corporation, *Dr. John Campbell*, who formerly resided in Glens Falls, New York, has recently moved his headquarters to Savannah, Georgia. Dr. Campbell is in charge of all paper research for the corporation.

◆

▸▸▸ Manager of the Board and Pulp Division of Union Bag & Paper Corporation, New York City, *Norman T. Beardsley* has recently been named chief of the Kraft Board Unit of the paperboard section of the War Production Board.

◆

▸▸▸ *O. W. Trumbull* was recently appointed vice president and general manager of Greene, Tweed & Company, New York City. He was formerly associated with Asbestos Textile Company.

O. W. Trumbull

▸▸▸ Recently appointed Postwar Planning Manager of Union Bag & Paper Corporation, New York City (cf. THE PAPER INDUSTRY and PAPER WORLD, October, 1942, p. 738), *Donald J. Hardenbrook* has now been made assistant to the president of the company. He will continue to have full responsibility for postwar planning.

◆

A. D. LITTLE, INC. ELECTS OFFICERS

The following officers were elected at the annual meeting of Arthur D. Little, Inc., Cambridge, Massachusetts, which was held January 27.

Roger C. Griffin of Needham, Massachusetts, son of *Roger B. Griffin*, who with *Arthur D. Little* founded the organization in 1886, was elected vice president, and *Henry G. Powning* of Manchester, succeeds him as treasurer. *Frank N. Houghton* of Elmwood, was elected secretary and *Russell H. Stephens* of Newton, comptroller. *E. P. Stevenson* as president, *Raymond Stevens* and *Thorne L. Wheeler*, vice presidents, were re-elected. Directors for the coming year are: *Earl P. Stevenson, Henry G. Powning, Roger C. Griffin, Horace S. Ford, W. Cameron Forbes, Randolph C. Grew, Royal Little, Charles E. Spencer, Jr.*, and *Alexander Whiteside*.

◆

▸▸▸ Assistant mill manager of the Hamilton plant of the Champion Paper and Fiber Company since 1941, *Homer H. Latimer* was recently named mill manager of the plant. *Clarke Marion*, vice president and mill manager until Mr. Latimer's appointment, is now spending most of his time in Washington in the company's interests.

◆

▸▸▸ A meeting of the Board of Directors of Beaver Pipe Tools, Inc., Warren, Ohio, on January 15 has resulted in the following organizational changes. *W. A. Neracher*, founder of the company 43 years ago and president during this entire period, was elected to the newly-created position of chairman of the Board. *W. A. Phillis*, formerly vice president, was named president and general manager; *M. W. Bechtel*, executive vice president and treasurer; *C. W. Shafer*, vice president, manufacturing; *E. R. Barkley*, vice president, sales; and *R. C. Mellinger*, vice president, accounting.

Follow this BASIC BEARING PRINCIPLE

★ for today's longer bearing life under continuous load!

★ for tomorrow's more compact design, more efficient performance, more economical maintenance!

★ for greater bearing capacity in any dimensional limit!

ROLLWAY'S RIGHT-ANGLED LOADING . . .
"better because it's simpler"

War has engineered complexity out of design, made simplicity a *"must"*. But in bearings—*the point around which most designs evolve*—Rollway's right-angle loading long ago reduced load problems to their two simplest components—*pure* radial and *pure* thrust.

The underlying principle is basic and universal. You *know* that every radial load and every thrust load is carried full-on, AT RIGHT ANGLES TO THE ROLLER AXIS. No oblique forces, no uncomputed resultants affect your design.

And every part of every load is supported by solid, cylindrical rollers of uniform cross-section. There's no weak point to invite stress localization, no wedging pressure, no danger of rollers pinching against the radius of the race.

Standard Sizes for Most Applications

S.A.E. or American Standard metric dimensions and tolerances are available for most applications . . . a wide range of sizes and types that are "engineered to the job." Avail yourself of Rollway's specialized bearing experience. Send your design or changeover sketch for free, confidential bearing analysis and recommendation. No obligation.

*TYPE MCS DOUBLE WIDTH RADIAL

*TYPE SDT DOUBLE ACTING THRUST

ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

BUILDING HEAVY-DUTY BEARINGS SINCE 1908 — BEARINGS

▶▶▶ The appointment of *Dr. Joseph S. Illick*, head of the Department of Forest Management at the New York State College of Forestry at Syracuse University, as acting dean of the college has recently been announced. The appoinment was made because of the illness of *Dean Samuel N. Spring*, who underwent a major operation recently and will be unable to return to the college for some time. *Assistant Dean Clyde Leavitt* will continue with his present responsibilities.

◆

▶▶▶ Formerly associated with the Wood Conversion Company, Cloquet, Minnesota, *William G. Van Beckum* has been transferred to the new development laboratory of the Weyerhaeuser Timber Company, Longview, Washington. Mr. Van Beckum is group leader in applied chemistry, a position he formerly held with the Wood Conversion Company.

◆

▶▶▶ President of the Hammermill Paper Company, Erie, Pennsylvania, *Norman W. Wilson* has been appointed to serve on the Pulp and Paper Industry Advisory Committee of WPB. He has also been appointed a member of the board of directors of the National Association of Manufacturers for the current year.

WM. C. CARTER NEW PRESIDENT OF LINK-BELT CO.

William C. Carter has been elected president of Link-Belt Company, Chicago, to succeed Alfred Kauffmann, who has resigned because of ill health.

Mr. Carter, a mechanical engineering graduate of the University of Illinois, joined the Link-Belt Pershing Road Chicago plant organization in 1902 as a draftsman. He has consecutively held the positions of engineering department supervisor, construction superintendent, plant superintendent, plant general manager, and vice president in charge of productiton. Because of Mr. Kauffmann's illness, Mr. Carter had been executive vice president in complete charge of company affairs for the past year.

William C. Carter

◆

▶▶▶ Officers of The Crystal Tissue Company of Middletown, Ohio, were re-elected at the annual meeting of stockholders held on January 26.

The officers include: *E. E. Grant*, president; *L. J. Long*, vice president and general manager; *E. A. Cahill*, secretary and treasurer; *H. H. Harrison*, vice president in charge of manufacture; *John J. Cahill*, vice president in charge of sales; and *W. E. Piper*, assistant sales manager.

◆

▶▶▶ Time required for Ordnance purchasing since Kimberly-Clark Corporation, Neenah, Wisconsin, has gone into Ordnance work on an extensive scale has made it necessary for *L. C. Stilp*, general purchasing agent, to devote his entire time to purchasing for the Ordnance Division. Therefore, *W. M. Wright* is temporarily acting as general purchasing agent for the corporation.

ATKINS *Silver Steel* RULE

Available from Stock for

IMMEDIATE SHIPMENT

Each Piece the EXACT DUPLICATE of Every Other

Yes, we can fill your orders for Atkins Silver Steel at once, without delay. Order the rule that never vary in height, temper, thickness . . . the easy working rule with a fine reputation among die-makers. The cost department will appreciate the long production runs secured with dies made from this tough, durable rule.

Whether it's rule, machine knives of all kinds, circular paper slitters, chipper knives, or saws, be sure to get the Atkins story before you place your next order. Ask for circular showing all stock sizes.

E. C. ATKINS AND COMPANY, 453 South Illinois Street, Indianapolis, Indiana.

CUTTING A NAME FOR THEMSELVES IN NATIONAL HIGH SPEED PRODUCTION

Now

APPEARANCE IS DOUBLY IMPORTANT!

In Paper — Opacity, Whiteness and Brightness still are the qualities which combine to make good appearance.

PAPER BUYERS have sincere sympathy for the paper manufacturer struggling under the weight of basic material shortages and war-time restrictions, *but they still demand papers of good appearance.*

In this situation the superior characteristics of TITANOX pigments give a unique advantage to their users.

Other pigments may give visual brightness up to the authorized limit; but the blue-white of TITANOX gives a greater visual whiteness than do pigments of the yellow-white type. Thus the opacity and blue-whiteness of TITANOX pigments contribute to the good appearance which is demanded even in war-time papers.

TITANIUM PIGMENT CORPORATION

111 Broadway, New York, N. Y.; 101 South Michigan Ave., Chicago, Ill.; 550 Townsend Street, San Francisco, Calif.; 2 Enterprise Street, Los Angeles, Calif.

TITANOX

TRADE MARK

OPACITY • WHITENESS • BRIGHTNESS

▶▶▶ New duties as West Coast Divisional Director of Pittsburgh Plate Glass Company will be assumed by *Louis F. Theurer* on March 1. Mr. Theurer succeeds *Floyd S. Green,* who is retiring after long and distinguished service with the company. *R. I. Ogle,* industrial paint sales representative in the Chicago territory, will take over Mr. Theurer's former position ot industial sales manager of the Milwaukee Paint Division.

◆

▶▶▶ *Leon E. Jeannert,* formerly assistant sales manager of The Babcock & Wilcox Tube Company, Beaver Falls, Pennsylvania, has been appointed manager of sales of the Welded Tube Division of the company, with general offices and plant at Alliance, Ohio. *William J. Thomas* is his successor. Mr. Thomas was formerly manager of mechanical tube sales of the company. *Edward A. Livingstone,* general sales manager of Babcock & Wilcox Tube Company at Beaver Falls, will also be general sales manager of The Babcock & Wilcox Company, Welded Tube Division of Alliance.

◆

▶▶▶ Formerly chief of the Special Projects Salvage Branch of WPB, *J. Widman Bertch* has accepted the position of Deputy Director for the entire Salvage Division. Replacing Mr. Bertch as chief of the Special Projects Salvage Branch is *Arden Yinkey, Jr.,* who was formerly his deputy.

◆

▶▶▶ Now active in the war effort is *C. Quincy Ives,* an engineer in the Ordnance Department. Mr. Ives formerly conducted his own research laboratory in Reading, Massachusetts.

◆

▶▶▶ Succeeding *Frank O. Hartwell, Rufus D. W. Ewing* has been made president of the Holyoke Card and Paper Company of Springfield, Massachusetts. He recently resigned as a vice president of the American Writing Paper Corporation, Holyoke, Massachusetts. Mr. Hartwell has been elected chairman of the board of the company, and *James P. Smith,* former chairman, will assume the duties of treasurer.

◆

▶▶▶ Technical director of the Hollingsworth & Whitney Company of Boston, Massachusetts, *Fred W. Nason* has been loaned to the Massachusetts War Savings Staff of the United States Treasury Department as associate administrator.

▶▶▶ Assistant general manager of the Ontario Paper Company, Ltd., Thorold, Ontario, *D. W. Ambridge* has become vice president of Polymer Corporation, Ltd., a Dominion Government company which is now establishing a huge plant in Ontario for the manufacture of synthetic rubber. The plant is being rushed to completion by a number of Canada's largest contractors, their activities being correlated under the direction of Mr. Ambridge, an outstanding operating and construction engineer.

◆

▶▶▶ Having resigned recently as superintendent of the Pulp Division of the Weyerhaeuser Timber Company, Longview, Washington, *George H. McGregor* has accepted an appointment as a senior chemical engineer in the pulp and paper division of the United States Forest Products Laboratory at Madison, Wisconsin. It is understood that no superintendent will be named to fill Mr. McGregor's position at Longview, at least not for the present.

◆

▶▶▶ An honorary membership in the Society of Chemical Industry has been conferred on *Dr. Harold Hibbert,* professor of industrial and cellulose chemistry at McGill University. The scroll which the Right Honorable Vincent Massey, Canadian High Commissioner to the United Kingdom, accepted on behalf of Dr. Hibbert after a ceremony at the Royal Institution, said the honor was conferred in recognition of a "long life of work as a teacher and a research worker."

Necrology

STUART H. BROWN

Stuart Harrison Brown, retired executive of Union Bag & Paper Corporation, New York City, passed away on January 19 at his home in Miami, Florida.

Mr. Brown had been with the Union Bag & Paper Corporation for

Stuart H. Brown

more than 35 years prior to his retirement in the summer of 1940. At that time he was secretary of the corporation.

Mr. Brown was 68 years of age. He is survived by his widow, a sister, and a nephew, H. Stuart Daniels, vice president of Union Bag & Paper Corporation.

WM. R. THOMAS

William Russell Thomas, retired chief engineer of E. D. Jones & Sons Company, Pittsfield, Massachusetts, passed away on January 8.

A native of Laconia, New Hampshire, Mr. Thomas was graduated from Massachusetts Institute of Technology as a mechanical engineer in 1887. Shortly after, he became associated with the E. D. Jones & Sons Company, remaining until his retirement in 1935. He had an important part in the development of paper mills and machinery and also designed mills for a number of foreign governments.

Mr. Thomas was 77 years of age. He is survived by his widow.

◆

FRANK G. WHEELER

Frank G. Wheeler, widely known chemical engineer affiliated with the paper industry, passed away on January 20.

Mr. Wheeler was affiliated with the Kimberly-Clark Corporation, Neenah, Wisconsin, for 30 years as a chemical engineer, and he designed and held patents on chlorine cells. He built Kimberly-Clark's first chlorine plant and also constructed similar plants in seven other cities in the United States and one in England. For the past eight years he had been a lecturer at the Institute of Paper Chemistry. Mr. Wheeler was an engineering graduate of Cornell University. He was a member of the American Institute of Chemical Engineers.

He was 64 years old. He is survived by his widow and two sons, Ward O. and Grant A., now directors of a machine manufacturing plant in Kalamazoo, Michigan, manufacturing paper mill supplies.

MIKE'S MAKING *Sure* HIS PUMPS GET A DRINK!

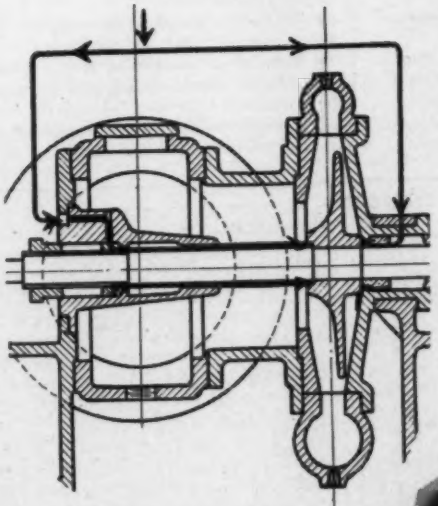
Mike has been around mills long enough to know what happens when pump packing boxes aren't flushed with clear, fresh water. He wants no part of the serious leakage, low efficiency, and air binding that lack of care can bring.

Flushing isn't much of a job either. In fact, with Miami pumps, it is a cinch because we've designed Miamis with a special water connection to make flushing both simple and effective. A twist of the handle and the job is done. (Water connection arrowed on tracing below).

Another Miami feature of particular importance is the adjustable impeller. When side plates wear, Miami's special design permits adjusting of clearance, thus bringing the pump back to high operating efficiency temporarily. And when you realize that new side plates can't be obtained quickly for any make pump, you realize how fortunate are mills with Miamis.

If we can help you with the operation of your Miami pumps, say the word. We have ample drawings, tracings, and factual data to make servicing easy.

SHARTLE BROTHERS
MIDDLETOWN, OHIO
Division of the Black-Clawson Co.



• CLOSE-UP OF MIAMI PUMP SHOWING WATER CONNECTION. MAKES FLUSHING OF PACKING BOX BOTH COMPLETE AND EASY

Miami Pumps

Water in the Paper Industry: New Developments and Wartime Economy

ROBERT T. SHEEN[1] and LEWIS B. MILLER[2]

Considerable progress has been made towards a more complete understanding of the effect of the quality of a water supply on the type of paper being manufactured. The TAPPI Water Committee is at present carrying on a thorough investigation of this phase of the water problem. In 1937, H. C. Schwalbe (H. C. Schwalbe, "Pulp and Paper Industrial Water Specifications," *Paper Trade Journal*, August 12, 1937) proposed certain standards of quality, dividing the requirements into standards for high grade papers and standards for lower grade papers. These standards were suggested as shown in Table I.

TABLE I—Proposed Standard for Paper Products

	Higher Grade (in ppm)	Lower Grade (in ppm)
Turbidity (max.)	5	25
Color (max.)	5	15
*p*H value (not in ppm)	7.0	6.7–7.3
Residual Chlorine (max.)	0.3	0.8
Total Dissolved Solids (max.)	75	150
Mineral Solids (max.)	80	200
Hardness (max.)	100	200
$KMnO_4$ (max.)	10	20
Iron as Fe (max.)	0.05 to 0.1	0.2
Manganese as Mn (max.)	0.05	0.1

More recently, the New England Water Works Association Committee on Quality Tolerances of Water for Industrial Uses in their Progress Report in 1940 proposed tolerances shown in Table II for a quality of water used in the manufacture of high grade light paper. (New England Water Works Association Committee Report on Quality Tolerances of Water for Industrial Uses Progress Report, *Journal of The New England Water Works Association*, Volume 54, pages 261 to 274, 1940.)

A survey by means of questionnaires circulated by the Water Committee of TAPPI indicates that there is a considerable variance of opinion among different paper mills as to what the permissible tolerances of concentration may be for different solids commonly found in water. This is true even among mills manufacturing similar products.

We believe that sufficient is now known from the data assembled to date to suggest some further classification of water requirements for various types of paper. Subsequent knowledge may indicate some revision as being desired or the need of additional groupings for special paper products and a table of tolerances (Table III) is suggested accordingly:

The headings for the several classifications are to be considered as suggestive only and it will be readily apparent that many papers and specialties not specifically named may be assumed to fall in one of the above similar classifications.

It will be apparent that the quality of the water supply available should have a material bearing on the location of a mill to manufacture a certain type of paper product, as it sometimes is not possible by any known method of treatment to economically produce a water of certain required characteristics. Many municipal waters are not suited for certain types of paper manufacture without further treatment. Most well waters are relatively constant in mineral composition, although occasionally there will be considerable variance between conditions of drought and plentiful rainfall, particularly in shallow wells.

Composition of surface water supply also varies in different sections of the United States. In general surface water supplies of New England and the Middle Atlantic States and of the Pacific Northwest are reasonably soft and clear. The waters of the Southern Atlantic States are relatively soft but may contain considerable color in the form of dissolved organic matter. Moving westward from the Atlantic Coast, the surface water supplies in general become harder, and quite hard waters are found in the prairie States west of the Mississippi and still harder water in the plain States near the Rocky Mountain region. Some hard waters and some soft waters with high natural alkalinities are found in the arid States of the Southwest.

An additional feature which must be considered in connection with the use of surface water supplies as a source of process water for paper manufacture is the question of pollution of the water supplies. Population centers and industrial plants on a stream above the paper mill may have a marked effect upon the quality of water at the mill. Not only present population and industrial activities must be considered, but the probable future trend in these two factors on the stream will bear on the decision of choosing a suitable location for a mill.

TABLE II—Suggested Water Quality Tolerances for the Manufacture of High Grade Light Papers:

Constitutent	Allowable Limits in ppm.
Turbidity	5
Color	5
Hardness as $CaCO_3$	50
Iron as Fe	0.1
Manganese as Mn	0.05
Total Solids	200

In addition before any conclusion can be reached as to the suitability of the water for the required treatment, it is necessary to consider to what extent it is possible or advisable to make the system a closed system. Both the size of the water treatment system and the design will be effected by this consideration.

Process water treatment, in general, to meet the desired specifications has as its objective one or more of the following:

1) Suspended solids and turbidity removal
2) Color reduction
3) Hardness and alkalinity reduction
4) Removal of iron and manganese
5) Removal or reduction of carbon dioxide, hydrogen sulphide, organics or free mineral acids

Most paper mills require considerable quantities of steam and the quality of the

TABLE III

	Photographic and Similar Papers	Writing and Book Papers	Wrapping and Bag Papers, Fine Finish Boxboards	Coarse Heavy Papers and Boxboards	Coarse Boxboards
Type	1	2	3	4	5
Turbidity (max.)	1.0	3.0	5	15	15
Color (max.)	3	5	10	20	40
*p*H value	6.8–7.2	6.7–7.3	6.5–7.5	6.5–7.5	5.0–9.0
Calcium Hardness as $CaCO_3$	25	40	60	100	150
Total Hardness as $CaCO_3$	50	100	150	250	500
Alkalinity as $CaCO_3$	50	75	100	150	300
Iron as Fe	0.05	0.1	0.2	0.2	0.5
Manganese as Mn	0.05	0.1	0.1	0.2	0.3
Residual Cl (max.)	0.3	0.5	0.8	0.8	1.0
Potassium Permanganate Test	3	5	10	10	20
Silica as SiO_2	10	15	20	50	No Limit
Total Dissolved Solids	75	125	200	300	600

This is the final installment of abridgments of papers presented at the fall meeting of the **Technical Association of the Pulp and Paper Industry** held at Boston, Massachusetts, September 29-October 1, 1942. Beginning with the October, 1942 issue, these abridgments have appeared in regular installments.

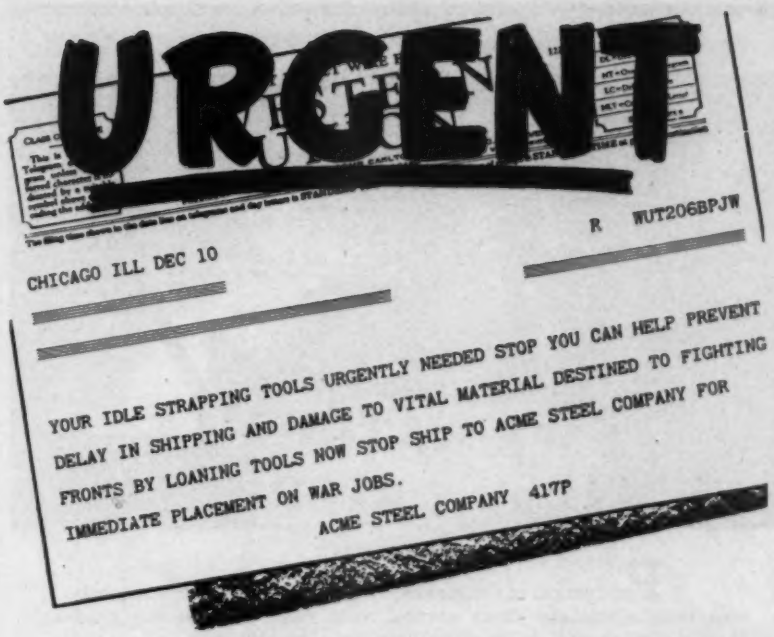
(1) Director consulting division, and (2) chemical engineer, consulting division, W. H. and L. D. Betz, Philadelphia, Pa.

raw water supply available must be considered for this purpose. Sometimes external treatment as used for process water will give a water of sufficiently low hardness as to permit its use in boilers with some subsequent internal treatment only, in other cases additional external treatment is required. There will be numerous cases where external conditioning of a boiler water would normally be indicated to give the best results but where internal treatment will have to carry the load for the duration of the war and until such time as the necessary equipment can again be obtained without the necessity for high priorities. Today, more than ever before, is proper conditioning of boiler water not only desirable but essential. Failure to properly condition may result in boiler tube losses at a time when tube replacements are difficult to secure promptly if at all. Maximum boiler efficiency is imperative, not only for economy but as a patriotic duty with impending fuel shortages that will be acute in certain sections of the country.

The scarcity of certain materials of construction together with Government regulations governing their use have affected the treatment of process and boiler feed water in numerous ways. As examples, hot process lime and soda softeners and pressure filters require steel pressure shells. In an effort to conserve critical materials, cold process softeners of the continuous type followed by gravity filters using concrete or wood for shells will prove a satisfactory alternate. In many types of design wood and concrete construction are taking the place of steel construction and will continue to do so until this present emergency has passed.

It is generally recognized that referee methods for water analysis shall be according to "Standard Methods of Water Analysis" as developed and published by The American Public Health Association (Water Handbook: *Chemical Analyses and Interpretations*, W. H. and L. D. Betz, Philadelphia, Pa. 1942). While these methods of analysis are generally considered as the most accurate methods available, in many cases they are slow and difficult to use for routine control procedures or for making a water survey where it is necessary to conduct a large number of tests rapidly and with a reasonable degree of accuracy. The use of rapid methods of analysis is often imperative if rapid variations in water characteristics are to be followed and evaluated in a control. With this need of the industry in mind, the TAPPI Water Committee is revising TAPPI Standard No. T-620m, "Analysis of Water" so as to provide a system of rapid procedures suitable to the requirements as enumerated. The revised standard will be ready in the near future for publication.

Recognizing a similar need among power plant operators and industrial water plant operators in general, a firm of consulting engineers has recently published a Water Handbook *Chemical Analysis and Interpretations*, W. H. and L. D. Betz, Philadelphia, Pa.' 1942) on the subject of methods of water analyses and their interpretations presenting rapid and accurate methods of water analyses that have been developed through long experience in the field of water treatment.


URGENT
R WUT206BPJW
CHICAGO ILL DEC 10
YOUR IDLE STRAPPING TOOLS URGENTLY NEEDED STOP YOU CAN HELP PREVENT
DELAY IN SHIPPING AND DAMAGE TO VITAL MATERIAL DESTINED TO FIGHTING
FRONTS BY LOANING TOOLS NOW STOP SHIP TO ACME STEEL COMPANY FOR
IMMEDIATE PLACEMENT ON WAR JOBS.
ACME STEEL COMPANY 417P

● ***Because steel strapping helps to assure safe, damage-free arrival to all types of shipments, from crated fighter planes to cartons of canned foods . . . demand for the speedy Acme strap-applying tools has taxed our capacity to the limit . . . all strapping tools are made from critical materials.***

How to draft your idle strapping tools for WAR WORK

Just send your unemployed Acme strap-applying equipment to Acme Steel Company. These tools will be placed with the armed services and in war plants. On strapping tools made by others than Acme, write the manufacturers.

Tools loaned will be replaced

The Acme tools which you loan to the war effort will be replaced whenever you need them. Or if you prefer, a cash credit, based on their present return value, is readily available. Will you please check up today . . . then let us know how many Acme tools you can spare and ship them direct to us.

ACME *Steelstrap* PROCESS

ACME STEEL COMPANY
2851 Archer Avenue, Chicago, Illinois

Production of Cooper alloy steel castings is a fussy job . . . requiring extremely close control over each step in the process. Raw materials are checked against rigid specifications . . . moisture content of sand is precisely controlled . . . pouring temperatures are closely regulated. Result? Sound castings . . . free of cracks, surface defects, cold shuts or seams.

Cooper can give you the right alloy for your application. For example, our designation CA22 (A.I.S.I. types 309 and 312, and A.S.T.M. designations A171 and A173) is widely used for economical service in sulphite pulp mills, for digester fittings, pumps, valves, fittings, etc. Write for new data sheet giving analyses, characteristics and applications of Cooper standard alloys.

THE *Only* ALLOY FOUNDRY WITH *All* THESE FACILITIES

- Laboratory control over raw materials and finished products.
- Dual foundry . . . both hand and machine molding.
- Heat treating of castings up to six feet in size.
- Machine shop . . . specially equipped for finishing stainless steel
- Improved cleaning . . . including Lustracast electrolytic finishing which leaves all surfaces bright.
- Castings furnished rough, polished or fully machined . . . one ounce to two tons.
- Development of special alloys to meet unusual requirements.
- Technical consulting service.

THE *Cooper* ALLOY FOUNDRY CO.
125 BLOY STREET • HILLSIDE, NEW JERSEY

Composition Bearings in Paper Mills

JAMES A. PETHO[1] and FRANK W. VOGT[2]
(1) Continental-Diamond Fibre Company and (2) Joseph T. Ryerson and Son, Inc.

Composition bearings are made with a filler such as paper, fabric, asbestos or glass and held together by a binder or synthetic resin. Depending on the type of filler and binder, and the time, temperature and molding pressure of the cure, materials with different characteristics will be produced.

For general bearing use we shall consider only the fabric base materials with a synthetic resin binder.

Just a few years ago the coefficient of thermal conductivity of synthetic bearings was approximately one hundred times smaller than that of a tin base alloy bearing; however, the addition of heat conducting fillers to the resin cut this difference by more than half, and indications are that this can be further increased without noticeably reducing the other desirable characteristics of the material.

All bearings, whether they are metallic or composition, are limited in performance by the maximum allowable temperature of the material. All plain bearings generate frictional heat and its control will spell success or failure in any bearing application. Friction is the result of surface contact and it is sensitive to the relative smoothness and hardness of the surfaces involved. The roll neck or journal should be smooth and free from scratches and pits. When heavy bearing loads are involved, the finishing of the necks must be done in a very careful way as it is one of the important factors in synthetic bearing operation. Good chuck fit is second in importance to smooth bearing surface. The chucks and the bearings should be machined to a good fit. When chucks and bearing liners are not in perfect agreement as to their contours, hot spots will develop due to the concentration of the load. If not controlled, failure is likely.

Regardless of make-up, this type of bearing has a fine resin film on the surface which is hard and slightly abrasive in action. This increases the operating temperature in the running-in period, and calls for extra care for the first few hours of operation. We can go further and take a bearing with a perfect chuck fit, roll neck in excellent condition, skin removed from the bearing surface and still have it operate hot. This behavior can be created by too large an arc of contact for the bearing. An arc of contact over 120 degrees is not desirable for synthetic bearings due to the resiliency of the material which under heavy loads will spring in and produce a chocking effect on the roll neck or journal. Where bearing loads are light, this behavior need not be considered. In some designs attempts are being made to eliminate this clamping by using a bearing with an ID up to 1/16 in. larger than the OD of the roll neck. Occasionally this cure is worse than the disease itself because if the load is not sufficient to compress and cold flow the material to the form of the roll neck, a heavy load concentration will take place resulting in a hot spot and eventual wiping of the bearing. Arc of contacts just large enough to maintain proper roll alignments should be used with synthetic bearings, and may be much less than with metal bearings. However, under light loading danger from hot spots is not serious. The proper contact area is gradually established in operation at a point where wear is eliminated.

So far we have considered the reduction of frictional heat by the means of providing perfect surfaces and bearing fits. However, due to the low heat conductivity of composition bearings their operating temperature must be regulated with proper application of a cooling medium. Knowing the critical temperature and the rate of heat generation the problem is reduced to determining the rate of cooling which will permit operation below this temperature. Cooling of roll necks or journals is generally accomplished by heat conduction through the medium of water.

An easy flow of water with ample volume rather than a jet type pressure spray usually is more effective. The water should be directed to cover as much as possible of the exposed journal surface. When bearings cover the top and bottom of the journal, the water should be applied to both sides between the top and bottom bearings.

Water, however, must be further specified: first, its temperature is a factor in

the rate of heat transfer; second, it must be free from abrasive impurities such as dirt, sand, etc.; and third, it must be free from chemical impurities such as salt. When there is a trace of salt or acid in the cooling water, a surface breakdown of the roll neck is sure to follow resulting in abnormal wear on the bearing. On the other hand, water in closed systems can be treated to result in increased bearing life.

Some experimentation may be required on each application as well as on the different makes of synthetic bearings to select the lubricant best suitable for the work.

Paper mill bearings are:

1) Submerged or flood water lubricated
2) Restricted or enclosed water lubricated
3) Grease and water lubricated
4) Grease or oil lubricated

The first includes bearings on such equipment as stock chests, table rolls, felt rolls, whippers, bottom press rolls, log hauls, etc. These bearings should be designed to permit the entrance of the water to the shaft. To let the water simply run over the bearing housing as it does on a whipper shaft or on a felt roll is not always sufficient. A small pipe should be brought to the bearing to feed water into the shaft. Bottom press roll bearings that are kept wet by water coming off the sheet may not need any more water for lubrication, but for safety a separate water supply should be provided.

The second includes bearings on such equipment as top press rolls, bottom calender rolls, jordan thrusts, grinders, etc. The water supply on these should be arranged so that it provides adequate lubrication without becoming a nuisance to the operator or without preventing satisfactory operation of the unit. These requirements are different as mill conditions vary.

The third includes bearings on such equipment as slow speed press rolls, some table and wire rolls, wet lap machines and some slow speed calender rolls. Usually block grease provides the simplest form of supplemental lubrication. It should be placed on the journal so that it does not completely cover the exposed surface and prevent the water from properly removing frictional heat.

The fourth includes bearings on such equipment as dryer rolls, dry table rolls, etc. These special applications are lubricated according to requirements and are mentioned here only to cover the complete range of possibilities.

Summarizing, the points of importance for successful synthetic bearing operations can be listed as follows:

1) Roll necks or journals should be polished smooth, free of scratches, and pits.

2) Chucks or bearing housings should be strong enough to resist the maximum bending force possible on the unit and to fit bearings to a point of suction.

3) Synthetic bearings should be of heavy weight fabric.

4) Arc of contact of bearing should be just large enough to maintain roll alignment.

5) Cooling water should be adequate to remove all heat generated in operation and should be free of abrasive and chemical impurities.

Paul Revere was skilled as a gold and silversmith. He became one of New England's most celebrated engravers. But for Longfellow's popular poem, his reputation for fine craftsmanship might have exceeded the fame of his midnight ride on "the 18th of April — seventy-five."

Among the connoisseurs of hand-wrought silver or of engraving his reputation as an artizan is still secure. Some of his descendants now live in Canton, Massachusetts, where, with the same spirit of fine craftsmen, good paper-makers' felts are made by DRAPER.

For reliability of material and workmanship specify **DRAPER FELTS.**

Draper Felts Favor Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

CANTON, MASS.

OUR REPRESENTATIVES *to serve you*

L. H. BREYFOGLE, Kalamazoo, Mich.
C. K. BEECHER, Delaware, Ohio
W. L. CAMPBELL, Savannah, Ga.
RALPH E. BRIGGS, Canton, Mass.
E.R. LELOFF, Vancouver, Wash.

6) Grease lubrication is advantageous on all low speed high pressure installations. The grease film should be capable of resisting rupture even under the maximum pressures.

The Role of the Technical Librarian in the Paper Industry

A. CATHERINE DAVIES
Hammermill Paper Company

Most technical schools neither require nor offer courses in library research; hence research men know laboratory techniques much better than library techniques. As a consequence, they may find library work monotonous and have the costly tendency of ignoring it. The appropriate person for library research is the trained technical librarian.

This librarian is familiar with chemistry and chemical research procedures; he is acquainted with the technique of pulp and paper manufacture; he knows what can be found in the company library, what can be found in other larger libraries, and how to make the whole field of technical literature available to any member of the organization. Above all, the competent librarian has the reputation of being enthusiastic about dispensing valuable, helpful, and timely information. His main object is to conserve the energies of those whose work is largely concerned with the information available in the library. He is the person who can keep paper men informed on the recent pertinent developments achieved by others, and can keep the specialized men from losing sight of the broader field.

The technical librarian's duties fall naturally into six distinct fields: periodicals, books, pamphlets, abstracts, bibliographies, and patents.

Probably the most useful, and certainly the most popular part of any technical library, is its periodical collection. This is true because periodicals contain detailed, not too general information, because periodicals contain practical, up-to-date information, and because men are more likely to read periodicals than books or pamphlets.

It is in the field of periodicals that the technical librarian can be of particular service. His duties here are two-fold: to make pertinent articles known to all those interested, and to make information from foreign articles readily available.

Books, contrary to popular opinion, are neither the most important nor the more popular part of the technical library. Their purpose is to supply fundamental broad texts in the fields related to pulp and paper technology.

The duties of the librarian in this field fall into two phases: that of helping to choose books, and cataloguing effectively the books already a part of the library collection. Quite recently, C. J. West has published an article on basic books for the paper mill library ("Paper Maker's Book Shelf," PAPER INDUSTRY AND PAPER WORLD, February, 1942, Vol. 23, p. 1085). Crane and Patterson have an excellent book, *Guide to the Literature of Chemistry* (John Wiley & Sons, Inc., N. Y., 1927), Soule also has an excellent work, *Library Guide for the Chemist* (McGraw-Hill Book Co., Inc., N. Y., 1938) and at the Buffalo meeting of the American Chemical Society in September of 1942, he presented a paper ("Frozen Assets—Putting Chemical Knowledge to Work") on the chemical library. M. G. Mellon has an excellent book, *Chemical Publications, their Nature and Use* (McGraw-Hill Book Company, Inc., N. Y., 1940). Two other excellent sources are the article by Molstad in New Edition (ACS) for April 10, 1938 (Vol. 16, No. 7: 206-14) and the article by Bailey in the *Paper Trade Journal* for November 30, 1939 (109, No. 22:97-104). All of these should prove exceedingly helpful in guiding the librarian in his choice of technical books.

Often it is helpful to know what other libraries have in their collections. The Institute of Paper Chemistry has published a catalogue of its very excellent library. This catalogue has been sent to member mills and can also be obtained from the Library of Congress and the New York Public Library.

One measure of the usefulness of the library is the completeness of the card catalogue. Particular care must be taken to index books by their actual subjects as denoted by the table of contents rather than by title words or actual titles. Cataloguing should be flexible enough to satisfy the imagination of any novice. Either cross-indexing or the use of additional subject cards, or both, will make an efficient card catalogue.

Though often overlooked until recently, a good pamphlet collection may prove a useful supplement to the book collection. Pamphlets from manufacturers and from state and federal bureaus afford an inexpensive method of building a library of contemporary technical information. Since one of the prime features of a pamphlet collection is as a source of current information, it is one of the duties of the collector to keep only the up-to-date pamphlets. A resorting is advised at least once a year.

An effective card catalogue of pamphlets is as imperative as a good card catalogue of books or patents.

If one were to maintain a library with but one reference publication, that publication would probably be an abstract journal.

Since 1907, *Chemical Abstracts* has held a preeminent position in this field. At the present time, over 2,800 American and foreign periodicals, as well as all United States and foreign patents related to chemistry are abstracted. Section 23 deals with Cellulose and Paper.

A fairly recent publication, but already recognized as outstanding, is the Bulletin of the Institute of Paper Chemistry. The abstracts here deal primarily with pulp and paper and do not include patents. The newest member of the abstract field is TAPPI'S Papermaking Abstracts which covers the field of patents as well as periodical literature. TAPPI abstracts previous to 1941 have appeared in *Paper Trade Journal* since 1922 and may be found by looking in the indexes of the Technical Section. Since 1918 paper abstracts have also appeared in the *Pulp and Paper Magazine of Canada*. British abstracts from 1841-date are available in the *Journal of the Chemical Society* and from 1882-date in the *Journal of the Society of the Chemical Industry*.

French abstracts have been published in the *Bulletin de la Societe Chimique de France* since 1858.

German abstracts date back to 1830 when the *Pharmaceutisches Centralblatt* was initially published. From 1850-56 the abstracts were continued under the name *Chemisches Pharmaceutisches Centralblatt*. Later the "Pharmaceutisches" was dropped and from 1897 to date the title read *Chemisches Zentralblatt*.

If the librarian wishes to borrow a book or periodical from any of the 255 libraries listed in *Chemical Abstracts*, he must first ascertain the "lend-lease" policy of the library concerned, then write it, stating clearly the exact title and date of the article desired together with a statement that he will be responsible for its safe return. The H. W. Wilson Company (950-72 University Avenue, New York) can usually supply back numbers of periodicals through its Periodical Clearing House. The Library of the Mellon Institute (Pittsburgh) is particularly complete, and is among those willing to lend periodicals to research libraries. Inter-library loans, however, are considered a last resource when other methods, such as photostats and microfilm, are not feasible; because the loan of such material weakens the resources of the lending library.

Translations are offered by 10 of the 255 libraries listed in Chemical Abstracts. The Hooker Scientific Library, Central College, Fayette, Missouri, makes a specialty of current literature translations.

Indexes are also quite helpful in making

● We offer safe, economical solutions to all pulp and paper mill drainage problems with our twill weave, plain weave, sewed seam, and soldered seam wires.

INTERNATIONAL WIRE WORKS
MENASHA, WISCONSIN

preliminary searches and in finding exact titles of articles, though they do not contain abstracts. *The Industrial Arts Index* published each month is the technical counterpart of *Readers Guide* and has been indexed annually since 1912.

Especially helpful to the engineering department is the *Engineering Index* which has covered articles in this field since 1884. Independently subscribed to, but directly connected with Chemical Abstracts is the *Decennial Index of Chemical Abstracts.* This index lists all articles, books, and patents abstracted in this periodical in four ways: by author, subject, patent number, and formula.

Bibliographies are excellent source books for any library. Outstanding in this field is C. J. West's *Bibliography of Papermaking* published by TAPPI. Another useful work is the *Bibliography of Bibliographies on Chemistry and Chemical Technology* (West and Berolsheimer, National Research Council, Washington, 1925). References cited in many comprehensive articles on technical subjects constitute good bibliographies. The periodical *Chemical Reviews* is particularly good in this respect. The Science-Technology group of the Special Libraries Association prepares timely bibliographies for its members. The quarterly *Bibliographic Index* (H. W. Wilson Company) contains a fairly large section on technical subjects.

If, in making a literature search, it is found there is no bibliography available, the technical librarian should prepare one.

The next step beyond a bibliography is the literature review. The literature review is a necessary prerequisite for any research project. It tells not only what articles have been written, but also gives the picture of the present state of the situation. It gives the extent of the research to date and who has done the principal work so far; it often suggests new projects or new approaches to old projects.

A good technical library for the paper industry should contain enough patents to keep the personnel well informed on current advances in mill machinery, new processes, new kinds of and new uses for paper. The fact that 30 per cent of all patent applications are later abandoned because of prior claim speaks volumes in favor of a thorough patent search before prolonged work on any new process.

The selection of patents is probably best accomplished by scanning the *Official Gazette of the U. S. Patent Office* each week, and ordering those patents related to the paper industry.

United States patents are obtainable from the Commissioner of Patents, Patent Office, Washington, at 10c a copy, regardless of length. *The Official Gazette,* published each week, prints important claims of all patents granted that week. *The Yearly Index* gives information on any patent granted during the year. Other publications of the Patent Office include the *Manual of Classification* and the *Annual Report of the Commissioner of Patents.*

As the volume of printed literature in science and technology increases, the research worker must rely more and more upon the librarian. It is in this service that the capable technical librarian can contribute greatly in maintaining his company's leadership in the industry.

Just what YOU want *from a heavy-stock pump*

Here are the significant phrases from a paper mill superintendent's report on Morris ST-P Stock Pump service: "---our machine operators like these pumps much better than the triplex stock pumps—more uniform flow of stock—better control of the stock—now handling 4% to 6% consistency—no trouble at all—very much pleased with their operation." Wouldn't you like to know more about the stock pumps that can win such hearty commendation? Just write for Bulletin 176.

MORRIS MACHINE WORKS — MORRIS ESTABLISHED 1864 — BALDWINSVILLE NEW YORK

CENTRIFUGAL PUMPS

This is the eleventh and final installment of abridgments of papers presented at the annual meeting of the **Technical Association of the Pulp and Paper Industry,** held in New York City, February 16-19, 1942. Previous installments have appeared consecutively in each issue, except November.

Cuprammonium Viscosity As a Control Method Review

THOMAS W. TOOVEY
Pulp and Paper Technologist
Pennsylvania Salt Mfg. Company

The use of the cuprammonium viscosity test has been mainly developed and used as a test for cotton and textiles. Recently, however, its significance as a control method in the manufacture of high-grade wood pulps has been acknowledged. Since 1930, this test has become more widely used in pulp and paper mill laboratories.

The main drawback of the cuprammonium viscosity as a control test has been the time consumed in carrying out the test. In recent years there have been numerous communications advocating modifications of the TAPPI standard method, and it may be as well to give this as a basis for further investigation.

Okada and Hayakawa (Okada, H., and Hayakawa, E., *Cellulosechemie* 12, No. 6:153-158, June 7, 1931) suggests a viscosity control test for bleaching, but use a nitrogen instead of a cuprammonium method. Reuben (Reuben, M. D. *Paper Trade J.* 95, No. 13:29-30, Sept. 29, 1932) reviews the use of the cuprammonium test as a method of evaluating chemical pulp and presents the variables of the viscosity itself. Thompson (Thompson, G. L., *Rayon Record* 7, No. 1:16-7, Jan. 6, 1933) gives a description of a method very similar to the TAPPI method and suggests the use of mercury in place of the steel weight in order to bring about the mixing.

Womersley (Womersley, J. R., *J. Textile Inst.* 26, No. 5:T 165-70, May, 1935) gives two monograms, one for routine calculations of fluidity used by the Shirley Institute, and one monogram for inter-conversion of results obtained at different cellulose concentrations. Doering (Doering, H. *Papier-Fabr.* 38, No. 13/14:8002, April 5, 1940) gives a simplified procedure for determining the cuprammonium viscosity of pulps. The dissolving of the pulp is carried out in a wide-mouthed bottle, the capacity of which is about 106 to 110 cc., so that there is very little room for air when 100 cc. of the solution are introduced. The slight quantities of the deleterious oxygen are removed by adding about 20 grams of elemental copper (any electrolytically pure copper is suitable) in pieces of approximately 1.5 grams each, which are shaken with the other contents of the bottle and pulp to accelerate the dissolving of the pulp without affecting the composition of the cuprammonium solution. The dissolved pulp is then poured into a capillary viscometer, the brief contact with air being without noticeable harmful effect, and the viscosity determination is made in the usual way. Tabulated data determined by the old method (with exclusion of oxygen through nitrogen) and the new modification show good agreement.

Fabel (Fabel, K. *Kunstseide* 18, No. 1:507 Jan., 1936) describes a modification of the Ost method which requires only 20 minutes to one hour and is of sufficient accuracy for practical purposes. It is suitable for the range of low and medium viscosities. Schmidt-Nielsen (Schmidt-Nielsen, S. *Papir-J.* 24, No. 7:65-8, March 15, 1936) remarks on the great variation in the results obtained when using different types of viscometers especially in the case of unbleached pulps. He recommends the use of less concentrated solvents and a viscometer of the falling sphere type, in which the same sphere is used for disintegrating the sample as well as for measuring its viscosity.

Prawdin (Prawdin, S. N. *Bumazhnaya Prom.* 15, No. 4:49-55, 1936; *Zell. u. Papier* 16, No. 12:581-3, Dec., 1936) suggests a rapid method for the control of the viscosity in the last stages of bleaching. A sample equal to about 0.6 gram of air-dry pulp is pressed out and disintegrated on a watch glass with a needle, and then treated with 5 cc. of 20 per cent ammonium hydroxide for 3 minutes by kneading with a glass rod. The mixture is transferred into a glass-stoppered flask (70 cc. capacity) containing 35 cc. of the cuprammonium solution and 20 metal balls, then it is shaken mechanically for 5 minutes and allowed to stand at 20 C. for 5 minutes. The glass stopper is replaced by a rubber stopper fitted with a calibrated pipet and the viscosity determined in seconds. Ennevaara (Ennevaara, Elis. *Pacific Pulp Paper Ind.* 10, No. 11:20-1, Nov., 1936; *Paper Trade J.* 104, No. 18:45-6, May 6, 1937) reduces the time required by the TAPPI method to one-half hour by means of a special piece of apparatus consisting of a small monel or steel cylinder fitted with a stirrer. The mixture is stirred rapidly and complete dispersion is obtained. The viscosity is determined in the standard TAPPI tube.

Krueger (Krueger, D. *Chem. Zrs.* 61, No. 3:45-7, Jan. 9, 1937) discusses the efforts made in developing instruments for determining the absolute viscosity of even very highly viscous substances. She gives a description of the Hoeppler falling-sphere viscometer, the Ubbelohde viscometer with suspended level, the Kaempf viscometer for high viscosity ranges, and the limitations of these instruments. In conclusion, brief reference is made to the special problems offered by the viscometric evaluation of cotton and wood pulp, such as the necessity of complete occlusion of oxygen during the entire procedure, the preparation and concentration of the cuprammonium solution, and the purity of the cellulose, etc. Ubbelohde (Ubbelohde, Leo. *Ind. Eng. Chem.*, anal. ed. 9, No. 2:85-90, Feb. 15, 1937) gives a description of the Ubbelohde viscometer with suspended level mentioned above. Hostomsky (Hostomsky, George, *World's Paper Trade Rev.* 108, No. 12; tech. sup. 82-3, Sept. 17, 1937) recommends the Hoeppler viscometer (industrial model CH) mentioned above, which operates on the principle of the falling ball, for routine viscosity determinations of pulp. The test is carried out in the complete absence of air and can be repeated as often as necessary. The possible error for a number of tests was always below 1 per cent.

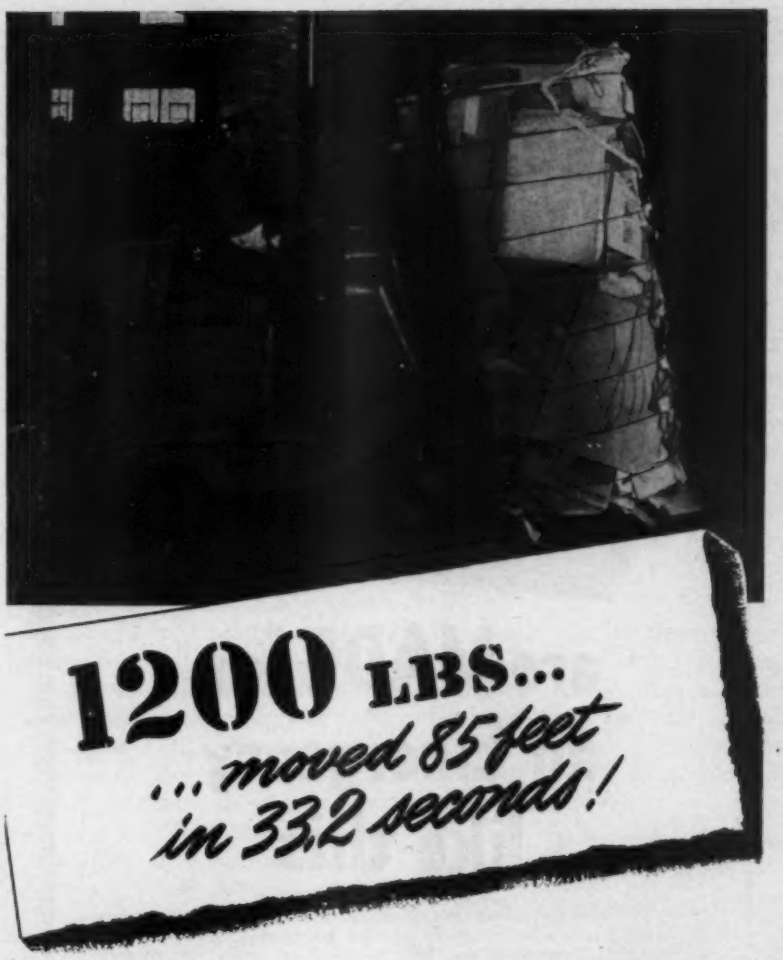
Schuetz, Klauditz, and Winterfeld (Schuetz, F., Klauditz, W. and Winterfeld, P. *Papier-Fabr.* 35, No. 15:117-21, April 9, 1937) describe a quick method for determining the cuprammonium viscosity so that an experienced worker can make a determination within 30-35 minutes with an accuracy of ± 2 per cent. In a specially constructed container with pycnometer closure, capacity 40 cc., 1 per cent air-dry pulp is dissolved in cuprammonium hydroxide under exclusion of daylight. The vessel is completely filled, and the air bubbles present are eliminated by careful stirring with a glass rod. Several acid-resistant steel balls are placed into the container and by slowly revolving the latter, help to accelerate the dissolving process which is complete after 10 to 15 minutes. The solution is then carefully poured into an Ostwald viscometer to avoid mixing with air, and the viscosity determination is carried out. The viscometer is placed inside a thermostat, the water temperature of which is regulated to exactly 20 C. and dyed red to avoid photochemical reactions.

The important points to be considered during the procedure are: careful manipulation to exclude oxygen; no admission of daylight; accurate weighing of the pulp; and exact regulation of the water to 20 C. The values will then hardly vary from those obtained by working in a nitrogen atmosphere. A dissolving period in excess of 15 minutes does not decrease the viscosity values; they remain constant for several hours, even under constant shaking.

Mease (Mease, Ralph R. *J. Research* Natl. Bur. Standards 22, No. 3:271-84, March, 1939) describes a relatively simple equipment and technique found practical for the measurement of the apparent fluidity of dispersions of cellulose in cuprammonium solution. Directions are given for the preparation and storage of the cuprammonium solution; for the construction and calibration of viscometers; for the dispersion of cellulose in the cuprammonium solution; and for the measurement of the fluidity of the dispersion. Some of the difficulties which arise in precise measurements are indicated and data illustrating the duplicity of results are presented.

Rich (Rich, E. D. *Pacific Pulp Paper Ind.* 14, No. 11:17-25, Nov., 1940; see also *Tech. Assoc. Papers* 25, June, 1942) gives a detailed description of the rapid method which has been successfully used in control work. Cuprammonium solution is made having 40.0 ± 0.5 grams copper per liter, 167.0 ± 0.5 grams ammonia per liter, and 12 grams sugar per liter. A separate solution of standardized ammonia is required having 167 ± 0.5 grams per liter and 12 grams of sugar per liter. The sample is treated with acetone and dried to about 96 per cent moisture free. After weighing a portion of the dried sample it is treated with the ammonia solution first and shaken mechanically for 30 seconds, then the cuprammonium solution is added and again shaken for 60 seconds. This treatment is sufficient to insure complete dispersion of the cellulose. The viscosity is then measured by means of a falling ball. The time required from the time of taking a slush sample to the measurement of viscosity is between 10 to 15 minutes for an experienced operator.

The use of the viscosity test as a method of control is mentioned in an anonymous article (*Silk and Rayon* 8, No. 4:179, 181-2, April, 1934) where the effect of *p*H on the activity of bleach liquor was investigated. An attempt was made to relate the viscosity and strength. Coster (Coster, N. W. *Pacific Pulp Paper Ind.* 7, No. 6:15-7, June, 1933) found that cellulose viscosity test is superior to any other chemical test for estimating the degradation of a fibrous material. The test is so sensitive that it will indicate the weakening of a fiber long before this can be noticed in a laboratory strength test. A mill should use the cellulose viscosity test in addition to physical tests for grading pulp. The great disadvantage, Coster states, of this excellent test is, however, the long time required to carry it out. This objection seems to have been removed when we consider the variety of quick methods which have been discussed above. McGregor (McGregor, G. H. Part I, II, and III *Pacific Pulp Paper Ind.* No. 10:9-10, Oct., 1935; No. 11:17-18, 20, 22, 24,



IT'S even faster when you consider the complete job cycle. Just look: one man and a Towmotor pick up a 1200-pound, 6′ x 4′ x 3′ bale . . . hustle it 85 feet down an aisle, through a doorway and into a freight car . . . spot it exactly in place . . . scurry back to pick-up point for another load . . . *all in 33.2 seconds by actual stop watch test!*

Unusual? Not at all! An entire freight car, containing 30 to 35 bales, is loaded in an average of 40 minutes. That job *formerly* took *four man-hours.*

Throughout the paper industry Towmotor is cutting costs and saving man-power by lifting loads as heavy as 7000-pounds, moving them as fast as 10 miles an hour, stacking them as high as 25 feet to make the most of storage space.

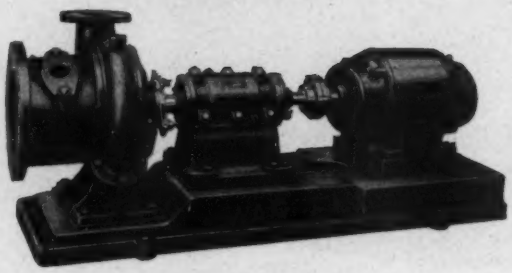
Such flexible, economical materials handling not only pays off today, but will continue to pay off tomorrow. Specific details telling how and why are completely outlined in our new manual, "The Inside Story." You can get a free copy of this comprehensive guide by writing Towmotor Corporation, 1220 E. 152nd Street, Cleveland, Ohio.

TOWMOTOR

ARMY E NAVY

THE 24-HOUR ONE-MAN-GANG

WARREN
★PUMPS★



are MADE for an Emergency like this

In our National Emergency, our all-out drive for Victory, the unfailing services of every man and every machine are needed. Warren Pumps are designed, engineered and built to stand up under the toughest circumstances . . . to stay on their jobs 24 hours a day if needed. We know that in the hundreds of Paper Mills served by Warren Pumps they will fully live up to the long Warren Tradition for Reliability. Warren dedicates itself to the American Cause. The services of our entire organization are at your disposal for anything that is within our power to do . . . to help you in your work to help America!

★

WARREN STEAM PUMP COMPANY, INC.
WARREN . . . . . MASSACHUSETTS

Nov., 1935; No. 12:20-6, Dec., 1935) in a study of the relation between the chemical and physical characteristics of representative types of pulp, found the following:

1. Degradation of pulps can be followed by the cuprammonium test.
2. There appears to be a definite relation between viscosity and fold quality of various types of pulps.
3. Relation between physical and chemical properties of pulps and degrading influences is specific in nature.
4. It would appear that acid causes least degradation of cellulose, bleach next, and heat the greatest change in given qualities.

McGregor discusses in detail the latest concepts of cellulose structure and makes a comprehensive survey of the literature. In studying the effects of chlorination on the properties of cellulose Murakami (Murakami, *J. Cellulose Ind.*, Japan, 1930, No. 10 abstracts 40) states that the lowering of the viscosity by chlorination is quite noticeable. He takes exception to the results published by Masuda and Suzuka (*J. Soc. Chem. Ind.* Japan, 1930, 33, 346; *Cellulose Ind.*, Japan, 1930, 7, 173). Murakami found that with standard cellulose the Cu number goes up and the viscosity drops at first markedly and later slowly as the time of bleaching is lengthened. The drop in viscosity is independent of the length of time of alkali treatment (15 to 60 minutes with 1 per cent NaOH.), but the Cu number is lowered as the time is lengthened.

In discussing the structure of cellulose Neale (Neale, S. M. *Rayon Record* 7, No. 3:120-1, March 3, 1933) mentions the significance of the measurement of the degradation reaction by means of the viscosity test. Okada and Hayakawa (Okada, H. and Hayakawa, E. *Cellulosechemie* 13, No. 6:97-100, June 12, 1932) state that their investigation of viscosity control in sulphite cooking showed a very close relationship between color and viscosity change. Near the end of a cook, the color of the liquor changes rapidly and the viscosity drops suddenly. The test is, they claim, more accurate than alpha-cellulose content or copper number for determining decomposition. Parsons (Parsons, J. L. *Paper Trade J.* 93, No. 1:42-44, July 2, 1931) studying cellulose fluidity (reciprocal of viscosity) gives the results obtained in relation to the more common criteria, such as bursting strength, folding endurance, copper number and alpha-cellulose content. Bialkowsky's cuprammonium viscosity test was used for determining the degree of bleach damage by Ross, Mitchell, and Yorsten (Ross, J. H., Mitchell, C. R., and Yorsten, F. H. *Paper Trade J.* 91, 20:53-4, 1930) in their investigation with soda pulp. They found that towards the end of the bleaching cycle the viscosity dropped very considerably for a very small change in color. The test proved useful in evaluating the influence of the hydrogen ion concentration in bleaching soda pulps. In discussing the uses of his method, Rich (Rich, E. D. *Pacific Pulp Paper Ind.* 14, No. 11:17-23, Nov., 1940; see also *Tech. Assoc. Papers*, 25, June, 1942) states he has used it as a control method in cooking, washing and blending, bleaching, beating and jordaning and drying the pulp and paper. Graphs and tables are given showing the variations in viscosity due to treatments given during the processing from the blow pits to the paper machine and also the effect of aging during storage of the finished paper.

Using Ekenstam's phosphoric acid method for the viscosity determinations (Ber. 69:549-52, 1936), Schmidt-Nielsen (Schmidt-Nielsen, *S. Papir-J.* 24, No. 7:65-8, March 15, 1936; No. 8:77-80) correlates the drop in viscosity with pulp aging. He suggests that this decrease is an indication of reduced molecular weight, a breaking down of longer cellulose chains

into smaller units. Van Beckum and Ritter (Van Beckum, William G., and Ritter, George J. *Paper Trade J.* 109, No. 22:107-9, Nov. 30, 1939), investigating holocellulose claim that the viscosities of these materials in cuprammonium solution reveal fundamental information of interest to pulp manufacturers. The holocellulose gives high viscosities in spite of the fact that it contains appreciable amounts of hemicelluloses. Its high viscosity indicates that it contains longer cellulose chains than does either the Cross and Bevan or the hydrolyzed holocellulose.

Heat Insulation—Its Relation to Mill Efficiency

R. C. PARLETT, Johns-Manville

Mill operations must be studied to prevent waste even though working under the strain of producing the maximum output in the least time. Since the mill is essentially a heat process, steam being used to generate power, and in large quantities for cooking, drying, and evaporating, a fertile field for saving lies in the heat wasted. No small part of this can be the result of a lack of, or inadequate use of heat insulation.

The engineer or superintendent in charge should not look upon heat insulation as a routine matter but give due consideration to its far reaching influence and its relation to production, to economy and to the productivity of labor.

Mill surveys may show some of the following or similar conditions.

1. Heated surfaces not insulated such as pipes, particularly flanges and fittings, or steam heated tanks, or other equipment.
2. Excessive condensation to be handled by traps and pumps from covered piping carrying saturated steam. When examined these lines showed portions which were left bare after repairing the piping, insulation knocked off or damaged, insulation wet or oil soaked from lack of proper protection, insulation originally chosen was inadequate in thickness, and insulation not sufficiently rugged or lacking structural strength necessary to withstand the particular service conditions.
3. With the increased production demands a lack of boiler capacity when a part of the boiler capacity is not available due to necessary repairs.
4. Notwithstanding windows being left open and outdoor temperatures cool, working conditions unpleasant and tending to reduce worker's productivity because the air was stifling hot.
5. An excessive drop in superheat, because of poor insulation, in a supply line to a steam turbine efficiency. This loss in temperature head is a loss of the most valuable portion of heat since in the case of superheated steam the capacity to do useful work is dependent not only upon the amount of the heat it contains but also upon its temperature.
6. Sweating of indoor cold water piping, the underside of roofs, or on humidifying equipment, causing damage to stored products or corrosion of metal surfaces.
7. Possibility of plant shutdown or delay

These Digester Parts *Withstand Corrosion and High Temperature*

Frequent replacement of the metal parts in digesters is expensive and interruptions of production add sharply to costs. Naturally, the sulfite process develops a severely corrosive condition which, combined with high operating temperatures, is ruinous to many metals. Yet high replacement costs are no longer regarded as a necessary evil by operators who have learned to specify Amsco Alloy for the metallic parts and fittings of their digesters.

Amsco Alloy was developed expressly to resist high temperatures and corrosion, and it is available in a number of analyses to meet a wide range of conditions. Where both corrosion and high heat are encountered, as in digester parts, analysis F-12 alloy is recommended. This chromium-nickel alloy is moderate in price and easily machinable. Its residual ductility, after having been subjected to stresses at elevated temperatures, greatly reduces the incidence of fracture.

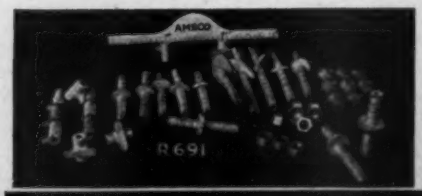
Amsco Alloy digester parts in service include sleeves, steam nozzles, gage glass plugs and fittings, blow valve bodies, wedges and seat rings and valve discs. These parts have long service life and afford greater ultimate economy than parts of less expensive metals which do not have the heat and corrosion resistance combined with ductility which makes Amsco Alloy F-12 *the sulfite paper mill's own alloy.* This is confirmed by T.A.P.P.I.'s analysis recommendations for materials of this type and for this service.

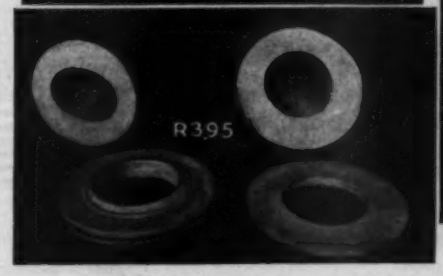
The long life of these Amsco Alloy parts helps to conserve critical metal, as does also the fact that castings with thinner sections can more judiciously be made of Amsco Alloy than of less suitable metals.

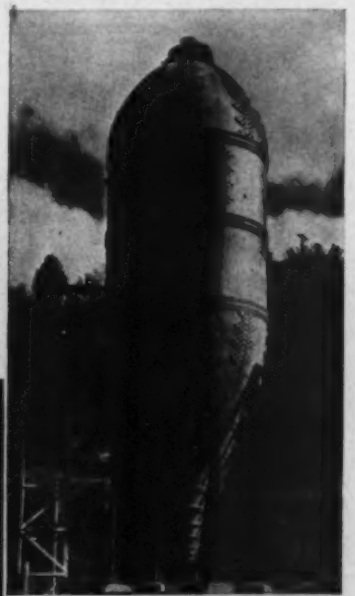
Write for Bulletin No. 108 containing full information.

R-691 F-12 Gage Glass Plugs and Fittings.

R-395 Wedges and Seat Rings of Amsco Alloy F-12.







Junk Your Scrap Now!

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

THE AMERICAN Brake Shoe

in production due to freezing on outdoor or exposed water lines.

All of the foregoing and other conditions may be found to be due to excessive heat loss, resulting from lack of or the improper type of insulation. It has been found that in some instances heat transmission losses to the surrounding air have been large enough, so that when effectively stopped by proper insulation, it was equivalent to putting a disabled boiler back on the line and bringing production up to the desired point. Improved working conditions have also resulted in addition to fuel savings.

Engineers generally recognize that it is good economy to insulate heated pipes, but other surfaces such as flanges and fittings often go unnoticed as they do not realize the magnitude of these losses.

A single pair of 6-inch standard flanges has an area of 1.8 sq. ft. and is equivalent to a linear foot of 6-inch pipe. The loss of heat is not visual as in the case of steam leaks which would quickly be remedied by tightening and packing. The heat losses are, nevertheless, just as real and continuous.

Bare surface losses increase rapidly with increased temperature of the surface, hence the need for insulation is even more important the higher the temperature.

It has been truly said that insulation is paid for whether it is bought or not because the cost of the heat loss without insulation in one year is generally considered greater than the insulation cost. Moreover, this heat loss cost goes on year after year so in effect the equivalent cost of the insulation is paid out many times.

The loss from any heated surface exposed to air is made up of two components, one designated as "radiation" and the other "convection." The radiation component has been expressed by Langmuir according to Stefan-Boltzmann in an equation (Langmuir, *Trans. Am. Electrochem. Soc.*, Vol. 23) showing that the loss is dependent principally upon the difference in the fourth powers of the absolute temperatures of the radiating surface and of the surroundings, and also upon the nature of the surface and surroundings whether bright, dull, etc., and to some small extent upon the geometrical arrangement.

The radiation portion of the loss is the only part that is affected by brightness of the surface. It has been shown by test that other than polished metal surfaces all ordinary materials such as iron and steel, brick, wood, concrete, plaster, as well as nonmetallic paints irrespective of their color have practically the same radiation loss.

Copper, brass, and aluminum have been shown to have lower radiation loss when new and brightly polished but these losses increase in service due to oxidation and by soiling from oil, grease, dust and dirt. However, it can be shown that even when applied on new commercially finished copper and brass pipe insulation pays a satisfactory return on its investment (Parlett, *Plumbing and Heating Journal*, Sept., 1938).

The loss by convection according to equation developed by Langmuir (Langmuir, *Trans. Am. Electrochem. Soc.*, Vol. 23) for still air under average conditions is dependent principally upon the five-fourths power of the difference in the absolute temperatures of the heated surface and the air. It also is known that the shape and position of the surface with respect to the natural air currents set up by the convection loss have some effect and that curved surfaces of small diameter lose heat at a greater unit rate than large diameters. It should be noted here that the term "still air" is used to denote only the condition where natural air movement due to the heat dissipated from the pipe exists and no forced or artificial circulation is present. However, the greatest effect on convection is that due to forced air currents such as would be occasioned by forced air circulation indoors or wind blowing on outdoor equipment. Langmuir (Langmuir, *Trans. Am. Electrochem. Soc.*, Vol. 23) shows that the increase in convection by air circulation is dependent upon the velocity. The total heat transfer from any surface can thus be calculated by adding the radiation loss to the convection loss for the given air velocity.

The large savings or reduction in heat losses from bare surfaces that can be made by proper insulation is definitely known from many tests. All standard insulation materials have been tested in some laboratory and some manufacturers regularly and periodically test their products in their own laboratories to determine insulating value and to insure uniformity in the product. These tests are run on electrically heated pipes and plates where the heat loss can be measured within one per cent. Pipes and outer insulation surface temperatures are accurately measured with thermocouples and tests are made in a closed room with accurate air temperature control under still air conditions. It is not necessary to test insulation in every pipe size in which it is manufactured in order to determine the losses.

The "conductivity" or rate of heat transfer between two flat surfaces 1 inch apart in B.t.u. per square foot per degree temperature difference between surfaces per hour can be calculated from the measured B.t.u. loss from the pipe using the well known rational formula for flow of heat (McMillan, *Trans. Am. Soc. Mech. Eng.*, Vol. 48, 1926; "Heat Transfer Through Insulation in the Moderate and High Temperature Fields: A Statement of Existing Data."). With the conductivity known from these tests it can be applied in the same formula to determine the loss on a pipe or other curved surface of different diameter. It also may be used in the same type of rational formula for calculating the heat loss from a flat surface where the insulation would be in the form of flat blocks.

The heat losses determined in this manner are shown on TAPPI Data Sheet 36a (TAPPI Staff, TAPPI Data Sheets, New York, Technical Association of the Pulp and Paper Industry) for laminated asbestos felt type of insulation. This incidentally is a paper mill product made from 40 laminations of asbestos felt per inch of thickness, these felts being manufactured on a conventional cylinder-type paper machine.

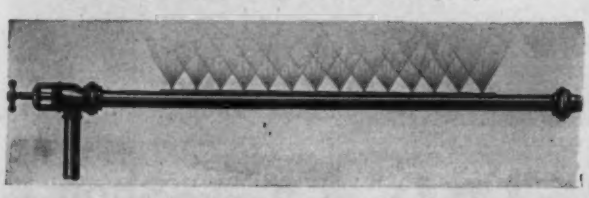
The heat losses through 85 per cent Magnesia pipe insulation are shown on TAPPI Data Sheet 36c (TAPPI Staff, TAPPI Data Sheets, New York, Technical Association of the Pulp and Paper Industry).

TAPPI Data Sheet 37 (TAPPI Staff, TAPPI Data Sheets, New York, Technical Association of the Pulp and Paper Industry) is a conversion chart from B.t.u. to coal.

Steam generating or boiler house equipment, such as boilers, turbines, pumps and piping, is generally conceded to require proper insulation, although they are not always properly insulated. Besides these, there are savings to be effected in the mill by the use of proper insulation. This applies to such equipment as digesters, cookers and bleaching boilers whether stationary, rotary or tumbling type, process

"RAINSTORM" SHOWER PIPE

More washing with less water and pressure — cleans felts and wires with less power for water pump.



THE SMITH & WINCHESTER Manufacturing Company
SOUTH WINDHAM • CONNECTICUT

PULP and PAPER MILL Screens

Precision perforations in all sizes for large production and screen durability.

Copper • Steel
Monel • Stainless Steel
Chemical Resisting Alloys

The Harrington & King PERFORATING Co.

5654 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N. Y.

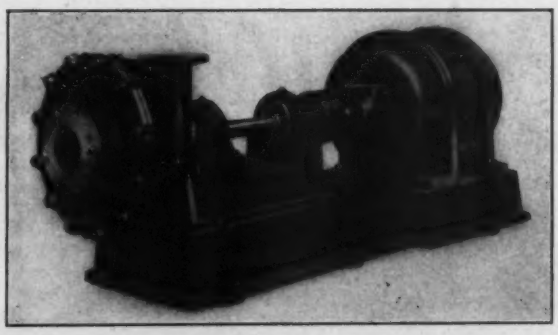
Geared to Help Win!

YES . . BAGLEY & SEWALL IS DOING ITS PART

DAY AND night, we are producing vital equipment for Uncle Sam. Grouped with those plants possessing extensive manufacturing facilities, we were enlisted early in the all-out effort, and today, the same craftsmanship and precision that built our paper making equipment is now geared towards winning the war. ★ Not until the complete mobilization of American industry in this effort was accomplished, did we fully realize its magnitude, its ability, or its power. Today, the enemy sees no victory . . . only defeat.

THE BAGLEY & SEWALL COMPANY - - Watertown, New York

PUMPS THAT PAY PROFITS



While standardized as to type and basic design factors, each LAWRENCE PUMP is designed and built TO PAY MAXIMUM PROFITS to the owner, under the specified operating conditions. When you buy a LAWRENCE, you're not buying "just another pump." You're buying GUARANTEED PERFORMANCE from a pump engineered to your specifications.

Yet, you'll pay no more for a LAWRENCE—because our methods are such that we can furnish you a "made-to-order" pump at a price no higher than that of a standardized type. So, let us—with your engineers—study your pumping or fluid handling costs, without obligation. Then, on a basis of GUARANTEED PERFORMANCE, put a LAWRENCE PUMP on the job.

LAWRENCE MACHINE AND PUMP CORPORATION
367 Market Street LAWRENCE, MASSACHUSETTS

LAWRENCE SINCE 1862
CENTRIFUGAL PUMPS

tanks, black liquor evaporators, heat exchangers, recovery furnaces, waste heat boilers, dryers, and steam accumulators. Surveys made in each mill to determine the loss on all heated equipment will undoubtedly show still other equipment where the possibilities of savings have never before been explored.

In making mill surveys to determine surfaces losing heat it should be stressed that no attempt be made to judge the need by the feel of the surface or even by measuring the surface temperature. Surface temperature alone is absolutely no measure of heat loss. The surface temperature will depend upon the temperature of the surrounding air, the proximity of other hot or cold objects, the velocity of the air adjacent to the surface and the nature of the surface, whether polished, dull, etc.

Air circulation, which exists in all installations, causes such large variations in heat losses with the same temperature differences that with an air velocity of only a few hundred feet a minute the surface temperature becomes meaningless.

The selection of the proper material for a particular service is an engineering problem and cannot be left to rule of thumb methods. These factors must be determined in a proper selection.

1. Suitable heat resisting qualities to withstand the maximum working temperature of the equipment. Laboratory and service heat resistance tests are the proper guides in this respect. It is not possible, as is often attempted, to deduce accurately from the chemical composition what will happen to a particular material under temperature.

2. Low conductivity: Conductivity must be known from accurate laboratory tests, over the entire temperature range at which the equipment will operate. It is not sufficient to know the conductivity at only one temperature since conductivity increases with temperature.

3. Sufficient durability and structural strength to assure long life under the particular service conditions must have sufficient internal strength to maintain its original shape and particularly its thickness on which its ultimate insulating value depends.

4. Adaptability: Furnished in a form readily applied to the particular surface.

5. Resistance to moisture, particularly low temperature insulation, or to chemicals in some particular installations.

6. Proper thickness to effect the most economical heat saving or to prevent sweating, freezing, excessive temperature drop, or to effect comfortable working conditions, etc.

7. Proper method of application to insure retention of its original strength when in place.

The selection of the proper material with full consideration for the temperature and other conditions, and the determination of proper thickness are of little importance if the material is applied improperly. There are some general factors which apply to the satisfactory application of all insulation. Among these factors are:

Proper waterproofing.

Proper method of securing the insulation.

Applying two layer insulation in staggered joint construction, particularly on high temperature equipment.

Proper sealing of low temperature insulation to prevent infiltration of moisture laden air.

Applying insulation tight against the surface as air spaces are a possible cause of heat leakage.

Proper protection of insulation surface against abuse.

Sealing outdoor insulation.

Moisture getting into an insulation will increase its conductivity approximately 5 per cent for each 1 per cent increase in weight due to moisture. Of course, deterioration of insulation may also take place under severe moisture conditions. In the case of low temperature insulation moisture infiltration not only causes increased conductivity but may cause the insulation to disintegrate due to freezing. The last and not by any means least factor in the proper application of insulation is that the work should be done by experienced mechanics.

Synthetic Rubber for Industrial Applications

H. H. HARKINS
United States Rubber Company

According to one authority, twenty-nine varieties of synthetic rubbers were studied in 1941, and that one manufacturer has made over 200 synthetic rubbers. Consideration will be confined to the few types that are commercially available.

The first commercially successful, and best known synthetic rubber is neoprene which is made by the du Pont company (polymers of chloroprene—several commercial varieties are being produced). Neoprene can be processed on rubber machinery with nearly as much ease as natural rubber. When properly compounded and heated, it polymerizes or "vulcanizes" to a product resembling natural soft rubber. It is better than rubber with respect to:

(a) Oils
(b) Deterioration by heat, oxygen, and sunlight
(c) Flexing life
(d) Gas diffusion

Usually it is less resistant to water than is rubber, but it can be formulated to yield products that are better than rubber is in resistance to hot water. These properties of neoprene make it useful (sometimes preferable to rubber) for certain products; such as:

(a) Hose, gaskets, packings
(b) Transmission and conveyor belts
(c) Boots where oil is a factor
(d) Soles and heels where an oil condition exists
(e) Tank linings where oil or high temperatures are encountered or both
(f) Soft roll cover, especially printers' rolls

Quite recently neoprene has been made available in semiliquid condition so that it may be used as a high solid paint or as a troweling compound. This type of plasticized neoprene may be of value for various corrosive conditions in the pulp and paper and other process industries.

HARDY S. FERGUSON & COMPANY

CONSULTING ENGINEERS

200 FIFTH AVENUE **NEW YORK CITY**

Hardy S. Ferguson—Member *A.S.C.E. A.S.M.E. E.I.C.*
Moses H. Teare—Member *A.S.C.E. A.S.M.E. E.I.C.*

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

- PULP AND PAPER MILLS AND OTHER INDUSTRIAL PLANTS
- STEAM AND HYDRO-ELECTRIC POWER PLANTS
- DAMS AND OTHER HYDRAULIC STRUCTURES

CARTHAGE MACHINE CO.

CARTHAGE, NEW YORK

« « «

Machinery for Ground Wood and Chemical Pulp Mills.

WANTED—Superintendent for fine paper mill. Initiative and experience in rag grades, cigarette, and lightweight specialties essential. Address Box 326, Fritz Publications.

WANTED—Man under 35 years with experience in purchasing for heavy manufacturing, of deferred draft status and familiar with priority matters. Engineering or chemical training considered desirable but not essential. Excellent opportunity for right man. In reply state fully availability and all relevant details. Address Box 327, Fritz Publications, Inc.

WANTED—One rebuilt or used 14 x 16 Twin Brownell Steam Engine or duplicate parts thereof. Address Box 328, Fritz Publications.

WANTED—Machineries for making straw board, 20 tons in 22 hours. Apply Modi Sugar Mills, Ltd., Begamabad (U.P.) India.

COLORS . . .

for Board and Paper

Green Chromium Oxides
Black, Brown, Red, Yellow Iron Oxides
Lamp Black—Umbers—Venetian Reds—Yellow Ochres

C. K. WILLIAMS & CO.
Easton, Pennsylvania

Fig. 8051
250 lbs. steam pressure

Instead of the usual wedge or disc, Fairbanks Sphero has a revolving ball plug which wipes the seating surface clean. Its shearing action cuts through heavy solids and liquids. There is nothing on which foreign matter can accumulate.

The opening in the ball plug is the same size as that in the pipe. There are no obstructions, no frictional resistance. It's clear sailing for steam, oil, water, etc.

Wear on seat rings is reduced to a minimum by the rotary motion of the ball. And seat rings can be kept permanently tight by adjusting the wedge at bottom.

It can be opened or closed as "quick as a wink" by the long lever handle. A positive stop tells when fully open or closed.

Seat rings or other parts which may become worn, can be replaced without removing valve from the line.

Try just one Fairbanks Sphero Valve for blow-off purposes and services where a full flow, quick-acting valve is desired and you'll wish you had used them before.

Send for Catalog No. 42 and name of our nearest distributor.

THE FAIRBANKS CO.
387 Lafayette St., New York, N. Y.

Boston, Mass., Pittsburgh, Pa.
Distributors in Principal Cities

Fairbanks Sphero Valves

One important characteristic of neoprene is that a good product can be made which is light in color or even white. This is not true of some of the other synthetic rubbers.

Butadiene, a hydrocarbon obtainable from petroleum or other sources, will polymerize to yield a rubber-like material. However, much better rubbers are obtained by interpolymerizing butadiene with other compounds containing an active vinyl group, such as styrene, acrylonitrile, vinylidene chloride, or other vinyl compounds (E. R. Bridgwater, *Chem. Met.* p. 139, Oct. 1941).

Perbunan or Buna N is a copolymer of butadiene and acrylonitrile. Next to neoprene it is the best known synthetic rubber. Perbunan will vulcanize with sulphur just as natural rubber will, and can be made to yield compounds of all degrees of hardness ranging from soft inking-roll stocks of 5-10 durometer up to a very hard ebonite. This synthetic rubber is characterized by the fact that carbon black must be incorporated if high tensile strength is demanded. Any so-called Perbunan stock which is light colored is likely to have low tensile strength and the other properties will be poor also.

Perbunan vulcanizates are very resistant to aliphatic oils, quite resistant to heat, and have low permanent set or good cold flow resistance. These properties, coupled with the fact that a wide range of hardnesses can be made, indicate that Perbunan could be used as a press roll covering material for paper machines.

Decker couch rolls covered with Perbunan have worked satisfactorily. Possibly the same technique would be applicable to large press rolls. It must be appreciated, however, that if attempts are made to use Perbunan or any other synthetic rubber in large rolls there will be numerous delays in delivery. No doubt many mistakes will be made before a synthetic rubber used as a press roll cover can approach the present high standard of performance of rubber-covered press rolls.

From the rubber manufacturer's standpoint, the chief drawback to this material is the difficulty in processing it, because it does not "break down" on a rubber mill in the same manner as rubber. Nevertheless, methods have been devised for handling it. It has excellent molding qualities.

Perbunan Extra is similar to Perbunan except that it is more oil resistant. It is a copolymer of butadiene and acrylonitrile in which a larger amount of the latter is used.

Hycar O. R. is derived from butadiene and an undisclosed ingredient. This synthetic rubber is similar to Perbunan, except that it is more resistant to oil. Like Perbunan it will yield vulcanizates with a wide range of hardness (Garey, Juve, Sauser, *Ind. Eng. Chem.*, p. 602, 1941).

Specially compounded Hycar O. R. yields soft vulcanizates with excellent resistance to heat, both wet and dry. Hycar is less resilient than rubber but is sufficiently "rubbery" for many purposes. In spite of its low resiliency (in general) the stocks properly formulated show excellent resistance to cold flow. It tends to stiffen at low temperatures but can be formulated to give compounds which have good flexibility under this condition.

Buna S is a copolymer of butadiene and styrene and resembles natural rubber to some extent. It is not oil resistant, but does have good resistance to abrasion and chemicals and good electrical properties. This synthetic rubber has been little used for mechanical rubber goods, since it is not oil resistant, the principal attraction of synthetic rubbers heretofore. With a shortage of natural rubber, Buna S may become an important synthetic rubber. It is capable of yielding vulcanizates of all degrees of hardness. These vulcanizates resemble compounds of similar hardness made from rubber with respect to chemical resistance and electrical properties. The electrical properties are superior to compounds of similar hardness made from Perbunan, Perbunan Extra, Hycar O. R., and the neoprenes.

Buna S can be bonded to metal satisfactorily and may prove useful as a tank or pipe lining material to replace rubber for all chemical solutions where rubber is now used; namely,

(a) All inorganic acids except strong oxidizing acids such as nitric and chromic.

(b) All inorganic salt solutions except those which are strongly oxidizing.

(c) Plating solutions.

(d) Inorganic bases, such as sodium hydroxide.

(e) Many organic acids, such as acetic, tartaric.

(f) Pickling solutions.

(g) Chlorine water and hypochlorite solutions.

There are a number of polysulphide rubbers known under the trade name of Thiokol. They are made from an organic dihalide and sodium polysulphide. This group is best known for its exceptional resistance to oil—both aliphatic and aromatic. They are quite resilient but have poor resistance to high temperatures and severe mechanical stresses. Thiokols are excellent for hose, printers' rolls, gaskets, self-sealing gasoline tanks, and many other mechanical goods where good resistance to oil is demanded. Their use can be greatly extended if necessary during the present emergency. They are not good at high temperatures and will not withstand severe mechanical stresses.

Synthetic rubber hose has been manufactured for several years, and has been used largely for handling gas or oil. This same hose could be made and used for handling water, acids, and alkalis. Neoprene would be preferred for high temperature work or where exceptional water resistance is a factor. Thiokol is suitable for low-temperature work for many services. The Buna types could perhaps be adapted to hose manufacture if necessary.

Suction hose could be fabricated from the synthetic rubber.

Conveyor belts are widely used in the pulp, paper, and paperboard industry for conveying chips, pulp, and not infrequently for transporting logs to and from barking drums. Coal is moved on conveyor belts in the paper and other industries. Belts for these services are made in various widths and plies and are rubber-covered (all around) to prevent water from entering the carcass and in order to protect from impact, gouging, and tearing, and to provide a surface at all points that will give maximum wear value. Synthetic rubber compounds have been developed out of which good conveyor belts can be made, in fact many have already been made, especially with neoprene.

Transmission belts in the pulp, paper, and paperboard industry are used for main line shafts of drive and various general power transmission drives such as found on thrashers, pumps, and beaters. Here again synthetic rubber compounds can be used in place of natural rubber; and in cases where oil is present or where high temperatures exist the synthetic can be used to advantage.

The continuous bleaching of pulp has resulted in an extensive use of rubber in certain paper mills, chlorine and hypochlorite solutions may conveniently be handled in rubber-lined pipe and tanks in this continuous bleaching operation. Vacuum washers have been rubber-covered, usually with rubber of a hardness from 10-20 plastometer. Compounds of suitable hardness, resiliency, and with sufficient resistance to heat and chemicals can readily be fabricated from the Buna types of rubber. Some difficulties would perhaps arise in applying synthetics here, but this type of equipment could perhaps be adequately protected with synthetics as more is learned about processing them.

Acknowledgment—The author wishes to thank his associates, O. S. True and E. D. Hoff, for assistance in the preparation of this paper.

Central's
SKID-EM-ON TRUCKS

LABOR SAVERS

Your workmen don't have to be truckhorses to operate a Skid-Em-On. Rolls can be handled with a minimum effort by only **one man** per truck! One man can easily load and haul a 600-lb. roll and do it with **absolute safety** for him and the roll. Roll handlers in mills throughout the country report Skid-Em-On their favorite.

Central Machine Works
437½ South Senate Avenue
Indianapolis, Indiana

"NON-USERS ARE THE LOSERS"

TENAX FELTS

PROFIT PRODUCERS

KNUCKLE DOWN!

Unusual problems confront all paper and board producers as we enter another war year. TENAX FELTS grimly accept the challenge of the times. They will run continuously, if necessary —and last longer. Now is your opportunity to clothe your machines with tenacious TENAX FELTS. They have produced profits for their users for more than fifty years.

"Non-Users Are The Losers"

LOCKPORT FELT COMPANY

Newfane, N. Y.—U.S.A.

FOR 57 YEARS

BOWSER

PAPER MILL OILING SYSTEMS
Have been the Unanimous Choice
of The Paper Industry

S. F. BOWSER & COMPANY, Inc.
FORT WAYNE, INDIANA

MISCO "C"
THE CORROSION RESISTANT ALLOY
CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
MICHIGAN STEEL CASTING CO., DETROIT, MICH.

PULP BLEACHING COMPANY
WAUSAU, WISCONSIN
EQUIPMENT FOR
CELLULOSE PURIFICATION
AND RELATED PROCESSES

How to De-Scale Equipment *Safely, Easily!*

The next time you de-scale your water-circulating or water-cooled equipment, do it the SAFER, easier Oakite way as so many other pulp and paper mills are now doing! Use OAKITE COMPOUND No. 32.

You, too, will find this remarkable material helps you conserve man-hours, reduce equipment down-time and increase operating efficiency in removing lime-scale deposits from cylinder wires, screen plates, Fourdrinier wires, suction press rolls, vacuum pumps, digesters, evaporators, Diesel engines, ammonia condensers, heat exchangers. Write today for FREE, 24-page manual giving details.

OAKITE PRODUCTS, INC., 16 THAMES ST., NEW YORK, N. Y.
Technical Service Representatives Conveniently Located in All Principal Cities of the United States and Canada

OAKITE CLEANING

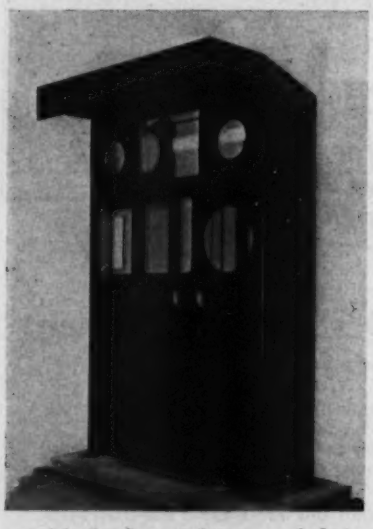
NEW EQUIPMENT AND SUPPLIES

Spatterproof Lamp for Welding

A spatterproof lamp for welding and rough industrial service has been introduced by the Radiant Lamp Corp., 260 Sherman Ave., Newark, N. J. The lamp is made of special glass that resists penetration of hot metal particles and is built to withstand severe handling. It has a T 10 bulb with medium screw base; is made in 50, 75, 100, and 150 watt sizes; and is known as the *Radiant Spatterproof Lamp.*

Masonite Panel for Instruments and Controllers

The Hays Corp., Michigan City, Ind., has announced an instrument and control panel in which Masonite is used for body, canopy, and doors. The body is of ⅜ in.



material; the doors and canopy, of ¼ in. Angle iron is used for framework and for reinforcing. According to the manufacturer, after the instruments and controllers are in place, it is practically impossible to distinguish a Masonite panel from a steel panel.

Humidifier for Steam Heating Systems

Techmann Industries, 828 North Broadway, Milwaukee, Wis., has announced a humidifier, the *Skilbeck "E-Humidifier,"* for steam heating systems carrying less than 20 lb. pressure. The humidifier is applied on the feed end of radiators or on the steam risers at points where condensate will return to boiler when radiators are turned off. In operation, the steam pressure is equalized inside the container of the humidifier to a point where the surplus condensate can be returned into the system against steam pressure. A water seal is used by forming a loop in the drain pipe, thus forcing the steam to enter the humidifier by an upper opening. According to the manufacturer, the unit deodorizes the steam and noiselessly diffuses it into the air, the quantity being adjusted to meet the requirements of any particular sized room.

Stacking Box Carrier

Ernst Carrier Sales Co., 1456 Jefferson Ave., Buffalo, N. Y., has announced a four-wheel carrier which has been designed to handle a column of self-nesting boxes. A

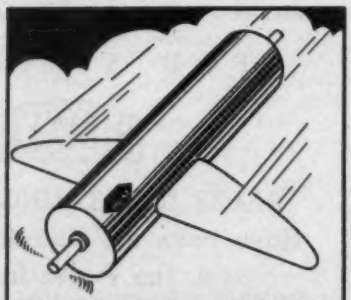
built-in wedge at bottom of lift post slides under stack and the stack is raised from the floor by leaning on the handle. When the handle reaches the horizontal position, it automatically locks into position. Forward tipping or swaying is eliminated by an adjustable clamp that lowers over the back edge of the top box—side sway, by a reinforcing bar that is mounted diagonally from the lift post to the base. The carrier has a rated capacity of 1,500 lb.

Soluble Oil

A heavy duty soluble oil, the use of which provides the finish, tool life and cooling formerly obtainable only with more than one oil, has been announced by Standard Oil Company of Indiana, Chicago. The new oil, according to the manufacturer, contains an effective amount of special compounding other than that required to give good emulsion characteristics; is stable in storage; mixes easily; does not gum machines or work; possesses good antirust properties; is noninjurious to workman's hands; and is not susceptible to odor development. In addition it has no harmful effect on machine lubrication where used as directed.

Vegetable Base Adhesive

An adhesive for various industrial applications, made by conversion of domestic starches and with plasticizing chemicals added to produce various drying or setting speeds, has been developed by Paisley Products, Inc., 1770 Canalport Ave., Chicago. In appearance, the adhesive, designated as *Vegimal,* is a viscous, light tan colored liquid. It weighs 10 lb. per gallon and is freely miscible with water. At room temperatures, in the undiluted condition, it is difficult to spread. Heated to approximately 120 Fahr. it liquefies and spreads to a gelatinous cohesive film. The film is instantly tacky, remaining so for considerable periods of time before drying, depending on formulation. Nonworking qualities, shrinkage of film, and duration of tacky state can be adjusted by amount of water dilution, thickness of film applied, and temperature of solution. The adhesive can be applied by means of automatic gluing mechanisms, hand brushing, spreader, or dipping.



FAST DELIVERY ON "SHAF-TITE" ROLLS

FOR WET FELTS

plus patented features that give greater value.

Write for Catalog!

RODNEY HUNT MACHINE COMPANY

38 Maple Street, Orange, Mass., U.S.A.

BUY WAR BONDS

KALAMAZOO
TANKS

. . . are built by men who have had years of experience with the problems of America's leading paper mills. Write for the complete details of how Kalamazoo Tanks save time and labor costs.

KALAMAZOO TANK & SILO CO.
KALAMAZOO MICHIGAN

"READY DRESSED" MILL COGS
LABOR SAVING—TIME SAVING

The Most Economical Filling That Can Be Put in a Mortise Wheel.

Ready Dressed

Blank Head

We Make Any Style or Size Wanted.

Write for Instruction Sheet "O" Which Is Free.

QUICK SERVICE ON ALL SIZES
THE N. P. BOWSHER CO., South Bend, Ind.

The Cram . . .
Low Consistency and Volume Regulator
(For Pulp Screening Systems)
Dryer Drainage System Syphon Installator, etc.
The Cram Company, Inc.
Appleton, Wisconsin

JEWELL BELT HOOK
The best for leather, rubber and cotton belting.
Potter's Patent—Every Hook Guaranteed
Manufactured and Sold by
JEWELL BELT HOOK CO.
Naugatuck, Conn.
Write us for name of nearest Dealer.

Two Jewell Potter Hooks after being driven through the belt.

Longcrimp Fourdrinier wire cloth, 30 times "up"

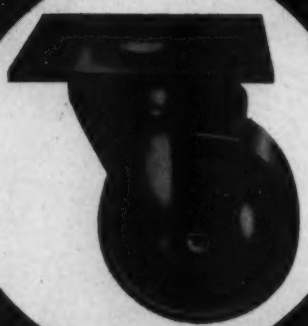
There can be no paper quality without wire cloth quality. The paper-forming process depends for its success upon the quality of the body mesh. Contributing factors are weave pattern, selvedge, seam, and the metal itself. It is on the bed of warp and shute knuckles pictured above that the slurry of interwoven fibres comes finally to rest.

Wire cloth today is tailored to the machine and the paper produced. Uniformity of mesh is paramount to paper excellence. At Lindsay, "uniformity" covers mesh opening, wire size, cloth thickness and firmness, knuckle height and shape, resistance to corrosion, abrasion and fatigue, and other points. We consider such many-sided uniformity a *fundamental* in filling your specifications.

THE LINDSAY WIRE WEAVING COMPANY
Serving the Paper Industry Since 1903
14001-14299 ASPINWALL AVE. • CLEVELAND, OHIO

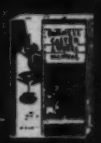
Lindsay WIRES
FOR PAPER MILLS

for Victory
— USE
QUALITY



DARNELL
CASTERS & WHEELS

Precision-made Darnell Casters with the DOUBLE BALL-BEARING SWIVEL assure a long life of efficient, economical service



★★★

A New FREE Book

DARNELL CORP. LTD.,
LONG BEACH, CALIFORNIA,
60 WALKER ST., NEW YORK, N.Y.
36 N. CLINTON, CHICAGO, ILL.

Forced Convection Heater

General Electric Co., Schenectady, N. Y., has announced a forced convection heater for use in warehouses, substations, crane cabs, watchmen's houses, and other similar

out-of-the-way places. The heater is controlled automatically; is rated from 2 to 15 kw.; and is available for floor, wall, and ceiling mounting. To install, it is necessary only to connect to nearest outlet.

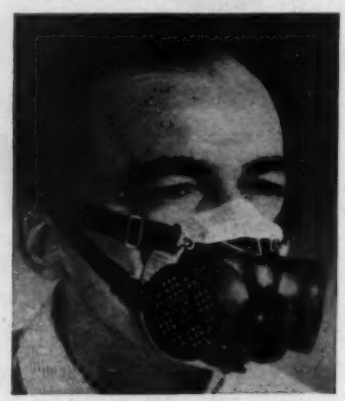
Window Unit for Oil Level Indication

Bijur Lubricating Corp., Long Island City, N. Y., has announced a window unit for convenient indicating of oil level when installed in a built-in oil-reservoir casting. The unit consists essentially of a window

of clear plastic assembled in a polished metal housing. An oil-proof gasket insures oil-tightness between window and frame. Two holes in the metallic background give passage to the oil. The unit is available in sizes to give clear window diameter of ⅜ in., 1 in., and 1¼ in., respectively.

Chemical Cartridge Respirator

H. S. Cover, South Bend, Ind., has announced a respirator (not a gas mask) of double-cartridge design. The cartridges are made of colored plastics—white, yellow and black. The white cartridges (soda-lime) are for use in light concentrations of inorganic acid gases, such as sulphur dioxide; the black (activated charcoal), for such operations as brazing and spraying and for light concentrations of organic vapors of such materials as carbon tetrachloride, formaldehyde, gasoline, kerosene, lacquer, naphtha, phenol, tar, and turpentine; and the yellow (combination of soda-lime and activated charcoal) for combinations of certain acid gases and organic vapors in light concentrations. The face piece is of molded



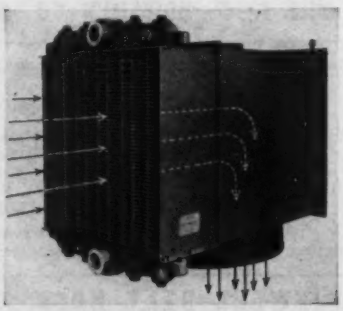
rubber which gives an airtight fit. An adjustable headband holds the respirator firmly in place. Filter pads are replaced by disassembling the cartridges. The unit is known as *Dupor Chemical Cartridge Respirator No. 10.*

Protective Sleeves and Aprons

Milburn Co., Detroit, Mich., has announced *Ply Garb* sleeves and aprons for use by workers exposed to water, acid, fire, alkalis, and chemicals of all kinds. These items are made of plastic laminated cotton cloth. The sleeves feature air vents to guard against excessive perspiration. The aprons, available in both full-front and split-front models, have adjustable shoulder straps.

Down-Blow Unit Heater

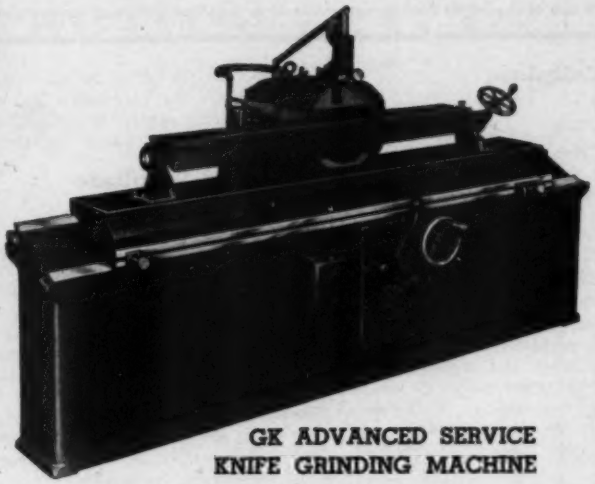
D. J. Murray Mfg. Co., Wausau, Wis., has announced a unit heater, designated as the *"Grid" Down-Blow Unit,* which incorporates the down-blow principle in its design. Special features of the unit, as pointed out by the manufacturer, in-



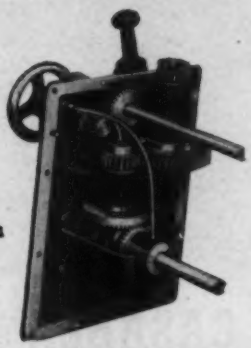
clude protection of motor from radiant heat of unit itself, sturdy construction, and heating sections of high test iron, cast in one piece, so that only one type metal comes in contact with steam or hot water. Patent application has been filed by the manufacturer.

SAW and KNIFE FITTING

COVEL-HANCHETT developments include the latest and always practical designs for the advancement of the art of securing perfectly fitted saws and knives.



GK ADVANCED SERVICE
KNIFE GRINDING MACHINE



Panel Type
Transmission

The transmission used in the GK precision Knife grinder is equipped with a **POSITIVE** clutch gear reversing unit, with a **SEPARATE** shock absorbing clutch, having a definite limitation of movement.

Smoothness, positive action and safety are available in transmissions by Covel-Hanchett.

COVEL-HANCHETT CO.

BIG RAPIDS, MICHIGAN — PORTLAND, OREGON

BALL OR ROLLER BEARINGS *used wherever possible in modern Johnstone Slitters, Rewinders and Uniform Tension Unwinders. One of the Extra Values—No "extra" in Price. Send for Bulletin No. 241.*

JOHNSTONE
Engineering & Machine Co.
DOWNINGTOWN, PA.

J. W. HEWITT MACHINE CO., Inc.
NEENAH, WISCONSIN

Builders of

Paper Making Rolls and Special Machinery
Roll Grinding a Specialty

TRIMBEY MACHINE WORKS
GLENS FALLS N.Y.

PULP SCREENS
WEIGHT AND CONSISTENCY REGULATORS
METERING SYSTEMS FLOAT VALVES

Gone to WAR

I'LL BE BACK

After We Beat the Axis

Until then all of our plant facilities are being used to make equipment needed by our fighting forces. Barking drums, screens, chip crushers, pulpwood chippers, wood cleaners—all paper mill and wood room equipment—withdraw from our production lines except where permission to make such equipment is granted by W.P.B. Necessities of war take their places. You'll agree with us that's the all-important job now. But, when all-out efforts triumph we shall be better able to meet your needs for new machinery and parts.

D. J. MURRAY MFG. CO.
WAUSAU, WISCONSIN

IN CASABLANCA

3,496 Miles from the U. S. A.

But there, in that heat simmered city on the North Coast of Africa, you will find Layne Well Water Systems identical with those in your own city. Built by Layne engineers, these Layne Wells and Pumps have long maintained their unmatched records of high efficiency, long life and consistent dependability.

Whether in Casablanca—or in any of hundreds of other cities in all parts of the world, Layne Well Water Systems have the quality and ruggedness that keep them going, even under terrific and long sustained overload. Every feature of their design is based upon the highest engineering skill—and then thoroughly proven in prolonged tests under the most rigorous conditions.

In all of the hundreds of installations made for Military and Naval needs in the rush for troop training and war need manufacturing, not one has failed. At present nearly 100 percent of Layne production and service is for war necessity but every effort is being made to repair and keep private and municipal installations in operation.

For Folders, Catalogs and Literature, address

LAYNE & BOWLER, INC.
Memphis, Tenn.

LAYNE
PUMPS & WELL WATER SYSTEMS

Affiliated Companies

Layne-Arkansas Company.....Stuttgart, Ark.
Layne-Atlantic Company.....Norfolk, Va.
Layne-Bowler New England Corp...Boston, Mass.
Layne-Central Company.....Memphis, Tenn.
Layne-Northern Company.....Mishawaka, Ind.
Layne-Louisiana Company.....Lake Charles, La.
Louisiana Well Company.....Monroe, La.
Layne-New York Company.....New York City
Layne-Northwest Company.....Milwaukee, Wis.
Layne-Ohio Company.....Columbus, Ohio
Layne-Texas Company.....Houston, Texas.
Layne-Western Company.....Kansas City, Mo.
Layne-Western Co. of Minn....Minneapolis, Minn.
International Water Supply, Ltd...London, Ont.

TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Sodium Cellulose Glycolate

This appears to be a cellulose ether (not ester), which is a water-soluble cellulose derivative that was found in Germany to serve as a suitable substitute for non-available materials. For many applications it actually appears to be superior to the product replaced. (According to Ind. Eng. Chem., this ether has been used as a substitute for gum arabic, and agar-agar. Various preparations serve in sizing and dressing in the textile industry and others may be used as emulsifiers and adhesives. The non-toxicity of the ether makes its use in the food industry possible.) F. Höppler. Chem. Ztg. 66, No. 13/14 (1942), 132; through Bull. Inst. Paper Chem. January 1943, p. 185.

Increasing the Life of Paper-machine Clothing

The author discusses briefly the scientific methods used in cleaning felts and wires with a view towards extending their life. T. F. O'Brien. Pulp Paper Mag. Canada 43, 760 (1942).

The Manufacture and Use of Filter Paper

In high grade papers only cotton linters and rags are used. The cooking and bleaching conditions are mild, and the fiber strength is not impaired. The pulp is not actually beaten but chopped, and there is no addition of size, fillers, or alum to the hollanders. The pulp is then transferred to chests provided with stirrers and mixed with distilled water to the proper consistency. The finest grades are made on hand molds.

When machine-made filter paper is manufactured, the stock is run over a fourdrinier with very fine mesh wires. Pressure is avoided as far as possible. On drying, special creping may be resorted to in order to increase the filtering speed of the paper. Tests on filter paper include tear strength, speed of filtration, and particle size retention. Filter papers very low in ash are obtained by acid washes (HCl and/or HF) followed by washing with distilled water. When papers are to be prepared for the filtration of solutions that attack the fiber, partly parchmentized paper of very high wet strength, but with high speed of filtration must be used. Special filter papers are discussed. For example, when starch solutions or sugar solutions are to be clarified, the filter paper may contain small quantities of diatomaceous earth. Combinations of high wet strength paper and filter cloth in filter presses appears to improve filtering efficiency and at the same time increase the life of the more expensive filter cloths. The preparation and use of specially fluted papers are outlined. Anon. Papier-Ztg. 66, 536 (April 19, 1941).

Calcium Sulphate Formation in the Sulphite Cook

The experiments described were made in a sulphite mill. They sought to find those conditions which would give the lowest yields of sulphate during the production of the acid, which was formed by burning sulphur in rotary burners, and leading the gases through four absorption towers, joined in series by the Hägglund system. Evidently the danger of incomplete combustion was omnipresent. By installing a pyrometer in the combustion chamber, however, and thus obtaining better control, and by insulating this chamber, it was possible to increase the temperature and to produce a gas containing 16-17% sulphur dioxide without danger of subliming the sulphur with a concomitant decrease in sulphur trioxide content. The main point of oxidation to the sulphuric acid stage takes place in the acid tower when an excess of air makes contact with the acid. By reducing the circulation in the acid tower, efficiency is reduced very little. On the other hand there is a notable decrease in the sulphur trioxide content of the cooking liquor when this technique is followed. There seemed to be no catalytic influence of selenium in the acid tower, but this element does act as a catalyst in the sulphur burner. By controlling the temperature in the combustion chamber, and coupling this with reduced circulation in the tower, calcium sulphate formation could be decreased by about 60%. G. L'Orange and F. Kittelsen. Papir-J. (Norway) 29, No. 22,226-9, through B.I.P.C. 13,177 (1943) (N.B. Only a Swedish abstract is available).

Pentosans in Rayon Pulp

While it is not essential to remove all the pentosans from pulp to be used in rayon manufacture, the content should not be higher than 2-4%. The removal of pentosans is best carried out with 6-7% NaOH at room temperature. The treatment is correlated with the intimacy with which cellulose and pentosans are bound together, the polymolecularity of the cellulose, and the structure of the native fiber. The pulp should not contain too much cellulose of low degrees of polymerization. The conditions seem to be met by careful alkaline cooks followed by cold alkaline extraction, with the avoidance of long cooking periods. E. Lindpainter. Melliand Textilber. 23, No 6, 285 (1942), through B. I. P. C. 13, No 4, 159 (1942).

Bob Williams
Barney Benson
Howard Gerber
Paul Foster
Buster Griffiths

WILLIAMS-GRAY CO.

221 North La Salle Street
CHICAGO, ILLINOIS

•

Specialists in

PAPER MACHINE CLOTHING
and other mill supplies
for over 35 years.

•

Representing manufacturers of

Lindsay and Niagara Wires
Knox "Excelsior" Felts
Siamese and Richland Dryer Felts
Tensilastic Rubber Rolls
Splicing Tissues, Etc.

RYERSON CERTIFIED STEELS

PROMPT SHIPMENT FROM 10 PLANTS

When you need steel of any kind, a single bar or carload, order from the nearest Ryerson plant. Write for Stock List.

Bars, Shapes	Shafting	Rivets, Bolts	Alloy Steel
Structurals	Tubing	Welding Rods	Tool Steel
Rails, Plates	Boiler Fittings	Stainless Steel	Floor Plates
Sheets—Strip	Reinforcing	Babbitt, Solder	Safety Tread

Ryertex water-lubricated Bearings give cleaner, more uniform products . . . reduced power consumption . . . longer bearing life . . . and eliminate lubrication—these are some advantages of Ryertex installations on Jordans, Beaters, Press and Couch Rolls, Grinders, Calenders, etc. Write for complete information.

Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Detroit, Cincinnati, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

50% and 95% *LESS!*

Last year, one of our Paper Mill members achieved a 50% reduction in Accident Frequency and a 95% reduction in Accident Severity as compared with 1940.

This means man power conserved—operating expenses reduced.

What enabled them to achieve these outstanding results? Full details await a request on your Company's letterhead to:

Paper and Pulp Section

NATIONAL SAFETY COUNCIL, INC.

20 North Wacker Drive, Chicago, Illinois

PAPERMAKING PATENTS

IN THE UNITED STATES — Compiled by James Atkins, Registered Patent Attorney

Inquiries should be addressed to James Atkins, Munsey Building, Washington, D. C.

Apparatus for Drying Webs of Paper Regenerated from Cellulose Derivatives

Patent No. 2,286,595. Ernest Bleibler, Ghent, Belgium. Application March 10, 1938, Serial No. 195,049. In Belgium March 11, 1937. 7 Claims. (Cl. 34—60). An apparatus for drying webs of paper regenerated from an aqueous solution of cellulose derivatives, including a base structure, side frames on said base structure, a roller train supported by said side frames, said roller train for supporting and feeding the web through and along said apparatus; a ventilation chamber arranged exclusively below said web and within the space enclosed by said roller train, said side frames and said base structure; a ventilating air generating device for generating a current of ventilating air within and longitudinally of said ventilating chamber, and a ventilating air distributing device for circulating said current of ventilating air within and transversely of said ventilating chamber and for directing ventilating air to sweep over the lower surface of said web; said ventilating air generating device including means for producing a current of fresh ventilating air, means for discharging the moist ventilating air from said chamber, said ventilating chamber having at least one inlet and one outlet spaced a substantial distance apart from each other, ducts connecting both said means, respectively, to said inlet and said outlet of said ventilating chamber; said ventilating air distributing device including at least one fan and one nozzle both within said chamber.

Manufacture of Sheet Material

Patent No. 2,286,924. Gunnar W. E. Nicholson, Panama City, Fla., assignor, by mesne assignments, to International Paper Company, New York, N. Y., a corporation of New York. Application January 12, 1938, Serial No. 184,525. 1 Claim. (Cl. 92—40). The process of forming a homogeneously interfelted web of cellulosic fibrous material, comprising flowing a layer of cellulosic fibrous stock upon the wire of a fourdrinier type of paper making machine, dehydrating said layer to an extent sufficient to impart a substantially permanent set to all the fibers of said layer while leaving the upper surface of said layer in a watery condition, flowing a quantity of thin aqueous adhesive solution upon the watery surface of said layer and thereby increasing the amount of water on the upper surface thereof, immediately flowing an additional layer of cellulosic fibrous stock upon the water and adhesive loaded surface of said layer, dehydrating said superimposed layers simultaneously by suction and simultaneously thereby commingling and interlocking the fibers and adhesive in the adjacent surfaces of said layers only, and finishing said web.

Method of Preparing Paper Stock for Application of a Moisture-Resistant Material

Patent No. 2,275,148. Richard E. Hornbeck, Kansas City, Mo., assignor to Waxide Paper Company, Kansas City, Mo., a corporation of Missouri. Application November 2, 1938, Serial No. 238,374. 5 Claims. (Cl. 91—67.9). The method of preparing a paper base stock for application of a coating material including printing a calendered paper base stock, wetting the calendered paper base stock after printing with water, forming the wetted paper base stock into a roll to prevent evaporation of the water and effect penetration of the water into the base stock, and supercalendering the base stock to render the base stock and printing absorbent to said coating material.

The Red Cross has Problems like your own

—of Planning

Your Red Cross operates a vast planning program to enable it to be ready for any disaster or emergency anywhere—whether it comes in the Americas, Europe, Australia, Asia, or Africa.

—of Organization

Your Red Cross is responsible for the smooth operation of 3,750 chapters and 6,000 branches, all engaged in the same enterprise of helping all who need help.

—of Personnel

Your Red Cross has tripled its staff since Pearl Harbor and has had to enlist the aid of and train over 6,000,000 volunteers in the principles of First Aid, Water Safety, Accident Prevention, Home Nursing, Nutrition, Nurse's Aideing, Mass Feeding, Motor Mechanics, and other subjects allied to our country's war effort.

—of Production

Your Red Cross is not only one of the world's foremost purchasers of supplies, but it has the immense distribution job of collecting millions of items from 10,000 different communities in the United States, assemblng and storing them, and then shipping them to practically every country in the world. Last year your Red Cross shipped some $60,000,000 worth of food, clothing, and medical supplies to over 20,000,000 homeless people in foreign countries.

—of Finance

Your Red Cross, whose war-time and post-war expenses will run well into hundreds of millions, must account to the public for every penny it collects and puts to work. Its accounts are audited annually by the U. S. War Department.

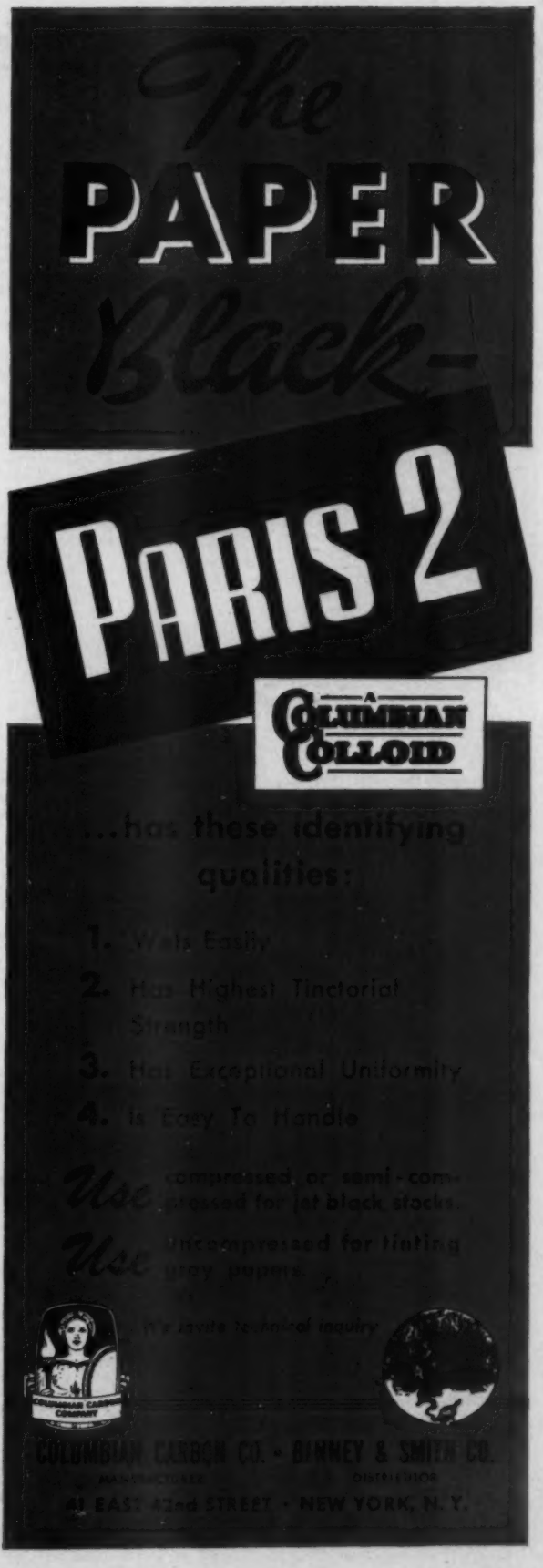
The Red Cross faces the same problems as are in your business. With your support it can successfully meet them.

The Second War Fund is greater than the First, but no greater than the increased needs.

Business men can help with time and with money, as organizations and as individuals.

March is the Red Cross month . . . Cooperate with your Red Cross Chapter.

Your Dollars help make possible the
AMERICAN RED CROSS


The
PAPER
Black-
PARIS 2
A COLUMBIAN COLLOID
...has these identifying qualities:
1. Wets Easily
2. Has Highest Tinctorial Strength
3. Has Exceptional Uniformity
4. Is Easy To Handle
Use compressed or semi-compressed for jet black stocks.
Use uncompressed for tinting grey papers.
COLUMBIAN CARBON CO. • BINNEY & SMITH CO.
41 EAST 42nd STREET • NEW YORK, N. Y.

New Catalogues, Publications, and Ass'n Reports

Acme Steel Co., Chicago—A new 6-page silverstitcher folder has recently been issued by this company, describing in detail the various standard and special types of carton stitchers available to shippers of war products. Specifications and numerous illustrations depicting special features and various uses are included. The folder may be obtained by writing to the company, 2840 Archer Avenue, Chicago.

American Manganese Steel Div., American Brake Shoe & Fdry. Co., Chicago Heights, Ill.—A 48-page booklet, No. 1142—SM, has just been published by this company. It contains explanatory material under the sections "What is Manganese Steel?"—"Amsco X-Ray Laboratory"—and "Properties of Genuine Manganese Steel." The rest of the booklet deals with steel in the blast furnace, the coke plant, the rolling mill, and the foundry. Numerous illustrations are included.

Atlas Powder Co., Wilmington, Del.—Atlas Spans and Tweens — new emulsifiers, detergents, and wetting agents announced by this company are described in a 24-page technical book now available upon request. The book contains tables on surface activity, interfacial tension, and spreading coefficients. Formulas of the materials, their specifications, their solubilities, and many suggested use formulas are also given.

Calco Chemical Div., American Cyanamid Co., Bound Brook, N. J.—A comprehensive study of stains and surface coloring has been prepared by William H. Peacock of the technical staff of this company under the title "The Formation and Uses of Stains." Copies are available on request to the advertising department of the ompany.

Elwell-Parker Electric Co., Cleveland, Ohio—"Lady Will You Give a Lift?" is the title of an instruction pamphlet for women operators of power industrial trucks recently prepared by this company. It is written in easy, direct conversational style, continuity being maintaned through large photographic illustrations of women at truck controls, with detailed directions on starting, steering, hoisting, lowering, and other mechancal operations. The various safety provisions are explained thoroughly, and the text closes with a checklist of "do's" and "don't's."

General Electric Co., Schenectady, N. Y.—"Electronics—A New Science for a New World" is the name of a pictorial booklet issued by this company, which presents the general story of electronics —its past, its present, and its possibilities for the future. How the electron is working today in war combat to perform many marvelous functions; in industry to step up production, increase human efficiency, and reduce material waste; and many other ways are all described and illustrated. A copy of the booklet may be obtained by writing to the company and requesting booklet GED-1024.

B. F. Goodrich Co., Akron, Ohio—Two publications have recently been issued by this company—the 1942 edition of its "Typical Examples of B. F. Goodrich Development in Rubber" and an engineering work sheet, which is a valuable addition to its catalogue section on vibroinsulators. The former publication consists of reproductions of 26 advertisements during the last year. Copies of it, as well as of the work sheet and catalogue section, are obtainable.

S. C. Johnson & Son, Inc., Racine, Wis. —The story of this company's wax-fortified paints is told in a new publication. The three main divisions of the book are: Why are they wax-fortified?, What makes them economical?, and Where are they used? Available finishes, colors, etc., and specifications are also given.

Leeds & Northrup Co., Philadelphia—An entirely new catalogue, "Micromax Electric Control," has just been issued by Leeds & Northrup. It describes control equipment capable of handling any process which can be controlled by positioning a value or other regulating device. Diagrams and text explain in detail how the equipment is adjusted to fit the needs of a particular process, and a number of pictures show the equipment in actual use in a wide variety of applications. A copy of the catalogue, N-OOA, may be obtained from this company, 4934 Stenton Avenue, Philadelphia.

Mercury Mfg. Co., Chicago—This company has just published an informative and attractively illustrated catalogue dealing with its approved models under the WPB Limitation Order L-112. Included is an explanation of the procedure for ordering a truck under this order, detailed description and specifications on the various models, and an explanation of the application for each type of equipment. Copies on request.

Oakite Products, Inc., New York City —Steam-detergent cleaning with Oakite solution-lifting guns is the subject of a new 24-page manual. The manual describes the improved steam gun which may be adapted for the removal of size, dirt, grease, and grime from a wide range of papermaking equipment, such as beaters, dandy rolls, cylinder wires, Fourdrinier wires, etc. A large group of typical, representative case histories are given. A copy may be obtained from the company, 16 Thames St., New York City.

Office of Alien Property Custodian, Washington, D. C. — A pamphlet, "Patents at Work," has been prepared to provide American industry with a brief outline of the policies which have been adopted for the administration of patents formerly owned by residents of enemy and enemy-occupied countries, now available for use by American industry. An index to the classified lists of vested patents for use as a guide in ordering specific sections is also included in the pamphlet. Over 150 patents are listed under Paper Manufacturing.

Shartle Bros. Machine Co., Middletown, Ohio—A 4-page folder covering the line of Miami Class DV centrifugal pumps for paper mill service has recently been issued. Specifications of the pumps are given, as well as diagrams describing construction and operation. Copies of the folder, No. 78-S is available upon request.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.—The Rototrol, a d-c drive control, for use where wide speed range or close regulation is required, is described in a new 14-page booklet by Westinghouse. The booklet describes how Rototrol increases the speed range; keeps the speed of a direct-current motor constant regardless of load variations; makes accurate or very close speed regulation possible; gives uniform acceleration and deceleration; and maintains constant horsepower and uniform tension. Charts, diagrams, and photographs explain how it regulates by transposing mechanical and electrical quantities. A copy of B-3123 may be secured from Department 7-N-20 of Westinghouse.

Wheelco Instruments Co., Chicago—This company has published a new Bulletin No. Z-6100, giving a condensed listing of the company's complete line of measuring and control instruments. Unit construction of temperature controllers is described and illustrated, as is the company's "electronic principle" for obtaining control without contact between measuring and control functions of the instrument. Remote controllers, combustion safeguard equipment, and other instruments are also covered.

Books

Supervising the Woman War Worker—A paper-covered publication of 34 pages, this booklet covers briefly and interestingly the background of the female industrial worker problem, lists a multitude of jobs that women can do, and comments on problems incident to hiring, induction, wages, uniforms, safety, reprimanding, and teaching of women employees. National Foremen's Institute, Inc., Deep River, Conn., the publisher, has priced the booklet at $.50 per copy for any number up to and including four. Quantity discounts apply for five or more copies.

Wage and Salary Stabilization—This paper-covered booklet is the work of Arthur W. Nevins, attorney and specialist on Labor Law. It is presented as a manual of questions and answers for employers, executives, and employees. The presentation relates to such subjects as: The Stabilization Program; Effective Date and Basic Provisions; Constitutionality; Persons Affected; Exemptions; Definitions of Wages and Salaries; Insurance and Pension Benefits; Wage Increases; Wage Decreases; New Employees, New Jobs, Extra Duties; Administrative Procedure; Unauthorized Payments; etc. Consisting of 39 pages of material, the booklet is priced at $.50 a copy by the publisher, National Foremen's Institute, Inc., Deep River, Conn. Special discounts are allowed on orders of five or more copies.

Association Reports

All of the orders which affect the industry emanate from the OPA and WPB and clear through the office of E. W. Tinker, executive secretary of the American Paper and Pulp Association. Copies of all government orders are sent by the Association to members. Listed below are releases sent out during January by the APPA. Any correspondence with that office regarding these releases carry indentifying titles and numbers as listed.

Labor Relations

Conscription No. 8—Deferment of Paper Mill Workers.

Union Agreements No. 2 — Union Agreement Analysist, 1942.

Legislation and Public Affairs

Foreign Trade No. 1—Exports.

Board of Economic Warfare—Current Export Bulletin No. 66: Export License Program Shipments to Seven South American Countries, Export Price Question Simplified.

General No. 1—Industry Prospects.

Federal Regulations

Materials and Supplies No. 1—M-261—Strapping for Shipping Containers.

Transportation—O. D. T. No. 1—Special Direction O. D. T. 18, Revised-5 Loading Paper, Paperboard, and Paper Articles.

Transportation—O. D. T. No. 2—List of O. D. T. Temporary Sub-Offices.

Transportation—O. D. T. No. 3—Release ODT-8 — Adjustments in Certificates of War Necessity.

Transportation—O. D. T. No. 4—Traffic Committee Survey.

Transportation—O. D. T. No. 5—General Order ODT No. 21; Amendment 4—Postponement of Final Tire Inspection Date to February 28, 1943.

Paper Production No. 1 — Limitation Order L-244.

Paper Production No. 3 — Orders — L-241, Commercial Printing; L-245, Book; M-241-a, Converted Products.

Paper Production No. 4—M-241 Clarified.

Paper Production No. 5 — 1943 Prospects.

CHEMIPULP PROCESS INC.

CHEMICAL PULPING PROCESSES

Hot Acid Cooking and Recovery Systems
Chemipulp--K-C Digester Circulating Systems with Chip Distributor and Full Automatic Controls

●

Chemipulp--K-C Improved Acid Plants
Gas Fortifying High Acid Concentration

●

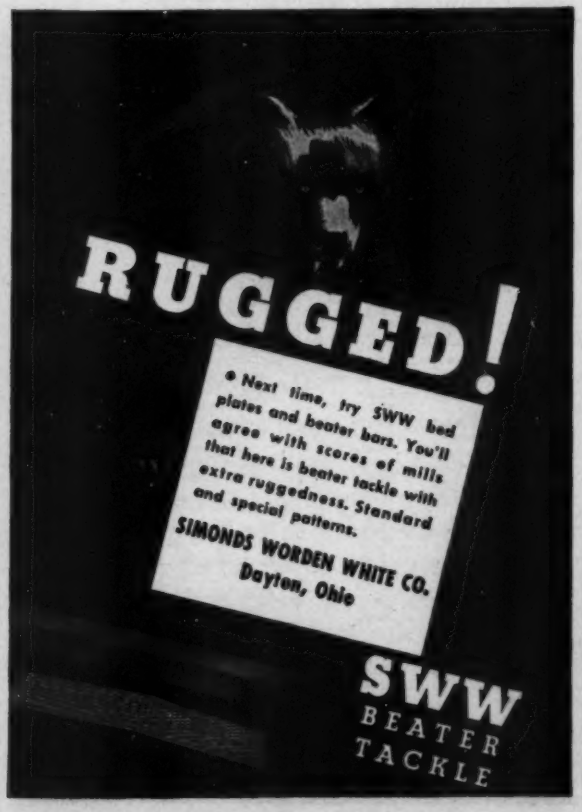
Digester Waste Liquor SO_2 Gas & Heat Recovery
Chip Pretreatment Preparatory to Cooking

●

500 Woolworth Building, WATERTOWN, N. Y.
3311 First Avenue South, SEATTLE, WASH.

- Associated with -

CHEMIPULP PROCESS LIMITED
403 Crescent Building, Montreal, P. Q.


RUGGED!
• Next time, try SWW bed plates and beater bars. You'll agree with scores of mills that here is beater tackle with extra ruggedness. Standard and special patterns.
SIMONDS WORDEN WHITE CO.
Dayton, Ohio
SWW
BEATER
TACKLE

The Bauer
DOUBLE DISC
PULPER
HAS GONE TO WAR!
The Bauer plant has been converted almost exclusively to munitions manufacture. We can, however, furnish pulpers to essential industries and do it promptly.
Prompt shipment of maintenance parts and supplies.
ARMY
E
NAVY
The BAUER BROS. Co.
SPRINGFIELD, OHIO

CURRENT MARKET QUOTATIONS

RAGS (Domestic)
f.o.b. New York City

NEW RAGS — *per cwt.*

Blue Overalls	5.25 to 5.50
Corduroy	2.75 to 3.00
Cottons—	
Washables, No. 1	2.85 to 3.10
Fancy Percales	4.25 to 4.50
New Soft Blacks	2.50 to 2.75
New Light Seconds	2.65 to 2.85
New Dark Seconds	2.40 to 2.60
Khaki Cuttings—	
Mixed	2.75 to 3.00
O. D.	3.25 to 3.50
New White Canvas	6.50 to 7.00
New Mixed Blacks	2.75 to 3.00
Shirt Cuttings—	
New White No. 1	6.50 to 6.75
Silesias No. 1	5.00 to 5.25
New Unbleached	6.75 to 7.00
Fancy	3.50 to 3.75
Linen Cuttings—	
White	14.75 to 15.25
Grey	14.50 to 15.00

RAGS (Domestic)
f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowances of $1 to $2 a ton depending on the value of the grade involved.

	per ton
Roofing—	
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	34.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)
ex dock New York City

NEW RAGS — *per cwt.*

New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)
ex dock New York City

OLD RAGS — *per cwt.*

No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

ROPE and BAGGING
f. o. b. and ex dock New York City

Gunny No. 1—	*per cwt.*
Foreign	Nominal
Domestic	3.75 to 4.00
Wool Tares—	*per cwt.*
Light	3.75 to 4.00
Heavy	4.00 to 4.25
No. 1 Scrap Bagging	3.50 to 3.75
Manila Rope—	
No. 1 large	-*115.00
No. 1 small	-*105.00
Sisal Rope—	
No. 1 large	-*95.00
No. 1 small	-*85.00
New Burlap Cuttings	5.75 to 6.00
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
No. 1 sisal	-*80.00
No. 2 sisal	-*60.00
Soft Jute	4.50 to 4.75
Mixed	1.25 to 1.50

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER
F. O. B. New York City

	per ton
Shavings—	
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, Unruled	57.50-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	33.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	16.00-
Flat Stock—	
No. 1 Heavy Magazines	33.50-
Mixed Books	16.00 to 17.50
Ledger Stock—	
No. 1 White	42.50 to 43.50
No. 1 Mixed (Colored)	36.50 to 37.50
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	37.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	65.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Overissue	16.00 to 17.00
No. 1 Baled	14.00 to 15.00
Old Kraft Corrugated Containers	30.00-
Old Corrugated Boxes	16.50-
New Corrugated Cuts	17.00 to 18.00
Mill Wrappers	11.00 to 12.00
Box Board Chips	7.50 to 8.50
No. 1 Mixed Paper	7.50 to 8.50

CHEMICALS
f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to -
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	19.00 to 20.00
80-100 mesh (bags), lb.	19.50 to 20.50
Argentine, lb.	—
China Clay—	
Domestic Filler Bulk (mine) ton	7.50 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	15.00 to 16.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl., lb.	.09 to -
Rosin (Gum)—	
New York, per 100 lbs.	
E	3.78-
F	3.93-
G	3.95-
WW	4.55-
Rosin (Wood), carlots	3.05-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30 -
Ground and flaks, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.10-
Pearl, barrels, cwt.	3.20-
Paper (Sp.) bags, cwt.	3.20-
barrels, cwt.	3.30-
Sulphur (crude)—	
(mine) bulk, long ton	16.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¼ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	.08¼ to .08½

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo.:

Bleached softwood sulphite	76.00
Unbleached softwood sulphite	66.00
Bleached hardwood sulphite	73.50
Unbleached hardwood sulphite	63.50
Bleached Mitscherlich sulphite	81.00
Unbleached Mitscherlich sulphite	72.00
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Standard news print siderurus	46.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	63.50
Bleached soda pulp	66.00
Unbleached soda pulp	62.00
Ground wood pulp	46.00
Sulphite screenings	38.50
Sulphate screenings	38.00
Ground wood screenings	30.00
Northern unbleached sulphate siderurus	73.00
Southern unbleached sulphate siderurus	63.50

PAPER
f. o. b. New York City

	per ton
Boards—	
Binders	84.00-
Chip	45.00-
Chip, sgl. mla. lined	60.00-
Coated, white patent .016	80.00-
.020 and heavier	75.00-
Kraft liner	60.00-
News	45.00-
Book (uncoated)	*per cwt.*
No. 1 Coated	15.50-
No. 2 Coated	14.00-
No. 3 Coated	13.25-
No. 4 Coated	12.75-
No. 2 Offset	11.00-
A Grade Super	10.75-
B Grade Super	10.25-
Bonds (Rag Content)—	
100% Rag	*per cwt.*
Ext. No. 1	42.50 to 46.00
100% Rag	35.00 to 37.75
85% Rag	
75% Rag	25.00 to 27.00
65% Rag	
50% Rag	20.80 to 22.75
25% Rag	18.20 to 20.00
Regular Colors	1.00 cwt. extra
Bonds (Sulphite)—	*per cwt.*
No. 1	11.70-
No. 2	10.75-
No. 4	9.90-
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)—	*per cwt.*
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50
Ledgers (Rag Content)—	
100% Rag	*per cwt.*
Ext. No. 1	41.40 to 48.50
100% Rag	36.25 to 39.25
85% Rag	32.20 to 37.75
75% Rag	26.25 to 28.00
65% Rag	22.80 to 27.75
50% Rag	22.10 to 24.25
25% Rag	19.50 to 21.50
Regular Colors	1.00 cwt. extra
Ledgers (Sulphite)—	*per cwt.*
No. 1	13.00-
No. 2	12.05-
No. 4	11.20-
News—	*per ton*
Rolls (Contract)	50.00-
Rolls (Spot)	(nominal)
Sheets	58.00-
Tissues (Carlots)—	*per ream*
White, No. 1	1.10 to 1.20
White, No. 2	1.00-
Bleached Anti-Tarnish	1.15-
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.60-
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.60-
Toilet, Bleached (M shts.) per cs.	5.65-
Toilet, Unbleached (M shts.) per cs.	4.25-
Towels—	*per case*
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05
Wrappings (Kraft)—	*per cwt.*
Extra Quality	5.75-
Super-Standard	5.00-
No. 1 Wrapping	4.75-
Standard Bag	4.12½-
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)	
Bleached papers—	
M.F. & M.G. Waxing, 30 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.25
Envp. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envp. Mla. (Prices based on large sheets untrim'd reammarked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-22 lb.	7.20 to 7.40
Grade B-30 lb.	6.75 to 7.00

AURAND

CLEANING TOOLS

ELECTRIC or PNEUMATIC
2 sizes of each

FOR ANY HARD SURFACE: IRON—STEEL—BRICK—CONCRETE—ETC.

EFFICIENT—Powered rotary chipping provides positive removal of foreign matter. Adjustable depth shoe prevents excessive chipping or damage to under surface.

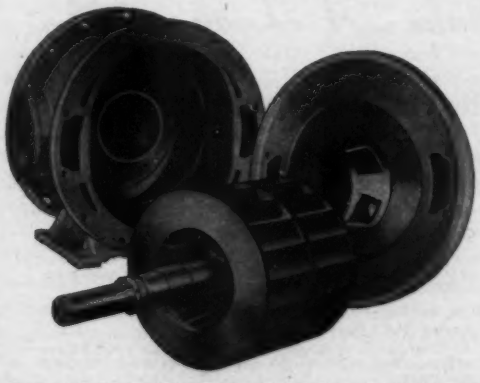
ECONOMICAL—Replaces sand blasting and other expensive, tedious methods. No special skill required to use . . . cutter heads renewable . . . motor cannot become overloaded.

COMPACT—Portable, compact, usable in any position; horizontal, vertical, overhead. Always ready for immediate use. Weight only 7, 8, 15 or 21 pounds.

For further information write Dept. 649.

AURAND MFG. & EQUIP. CO.
2643 Colerain Avenue • CINCINNATI, OHIO

SIMPLICITY



NASH VACUUM PUMPS HAVE ONE MOVING PART

Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

CAMACHINE 10-14D

For low cost production of NARROW BOARD ROLLS

(up to 72" in diameter)

THIS MACHINE is designed especially for high-speed low cost production of narrow width paper board rolls up to 72" in diameter. Camachine 10-14D operates at speeds up to 1500 F.P.M. and slits rolls to as narrow as 1/2" in width. Finished rolls up to 50 inches in diameter can be produced on the standard model Camachine 10-14D. At extra cost the same machine can be equipped to handle rolls up to 72 inches.

Special features adapted especially to paper board mill requirements are the water-cooled mill roll brake, and the large diameter rewind drums which avoid cracking the web when threading up the machine.

Write for interesting folder.

CAMERON MACHINE COMPANY, 61 Poplar Street, Brooklyn, New York
MIDWEST OFFICE: Harris Trust Building, 111 West Monroe Street, Chicago

IMPROVED PAPER MACHINERY CORPORATION

NASHUA, NEW HAMPSHIRE

CONTINUOUS ROTARY VACUUM FILTERS, including:

Black Liquor (Brown Stock) Counter-Current Washers

Bleached Stock Washers

Sheet Forming Machines

Sludge Filters

Save-alls

Special Purpose Filters

FLAT SCREENS—IMPCO Low Type with Dunbar (Patented) Drive

OPEN CYLINDER MACHINES, including:

Deckers (Single or Double End)

Multiple Stage Washers (2, 3, 4 or 5 Stage)

KNOTTERS

CENTRIFUGAL PULP SCREENS

BLEACHING EQUIPMENT (THORNE)

PNEUMATIC MACHINES (Raw Water Filters, Thickeners, or Save-alls)

TRAVELLING SHOWERS (With Hydraulically Operated Oscillating Nozzles)

OPEN CYLINDER MOULDS (Brass, Bronze, Iron, or Stainless Steel)

LABORATORY OR PILOT PLANT EQUIPMENT, including:

Midget Filters

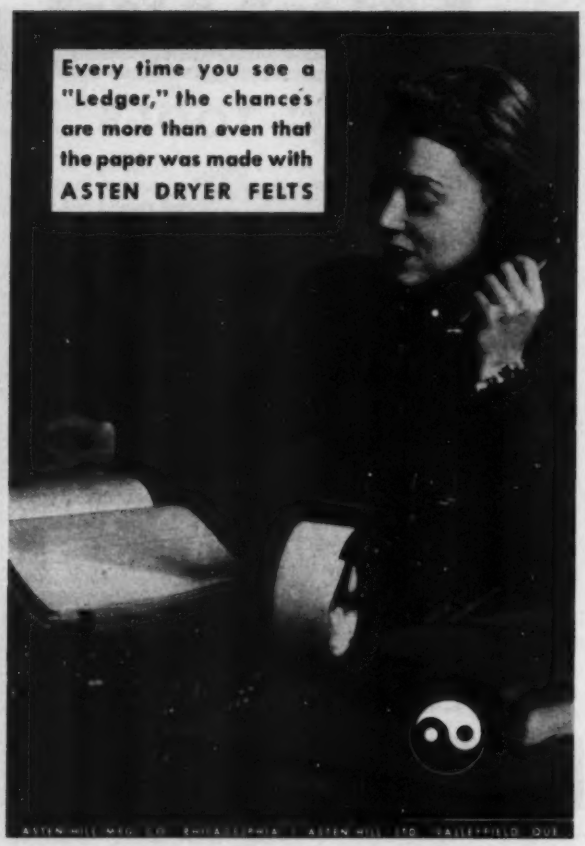
Flat Screens

Deckers

SPECIAL MACHINERY

Also auxiliary equipment including Shredders, Re-pulpers, Mixers, Stock Volume-Metering Devices, Bellmer Agitators, etc.

Write for additional information and IMPCO services.



Take A Look

9 Publications For Papermakers

Modern Pulp and Paper Making **$6.75**
G. S. Witham, Sr.
Second Edition, Revised and Enlarged. A book of 704 pages, written for machine tenders, beater men, and other practical mill workers, as well as for engineers, technologists and executives.

Trouble on the Paper Machine ..... **.75**
Archie McCaffery
A Monograph—published in convenient pocket-sized edition. Bulk rates, in groups of ten or more, 50 cents per copy.

Pulp Bleaching (A Symposium) ..... **.50**

Technology of Papermaking Fibers ..... **.50**

Spots and Specks in Paper ..... **.50**
Murray M. Rubin and Milton L. Rubin

Lessons in Paper Making—*Part 1* ..... **.50**
Harry Williamson

Lessons in Paper Making—*Part 2* ..... **.50**
Harry Williamson

Drying of Paper on the Machine **1.00**
B. M. Baxter

Procedure Handbook of Arc Welding Design and Practice **1.50**
Seventh Edition—latest information on all phases of arc welding—1308 pages—1810 illustrations. Standard text in hundreds of schools and colleges. ($2.00 outside U.S.)

Now available postpaid from

FRITZ PUBLICATIONS, INC.

59 E. Van Buren St., CHICAGO, ILL.

INDEX TO ADVERTISERS

When writing them, please mention The Paper Industry and Paper World

Acme Steel Company.....1157
American Chain & Cable Co. 1186
American Cyanamid & Chemical Corp.1107
American Manganese Steel Div. 1165
American Red Cross.....1179
Appleton Machine Co., The.....
Appleton Wire Works, Inc. 1092
Appleton Woolen Mills.....1100
Armstrong Machine Works.....
Asten-Hill Mfg. Co. 1184
Atkins and Company, E. C. 1152
Aurand Mfg. & Equipment Co. 1183
Bagley & Sewall Co. 1167
Bakelite Corporation .....
Baker-Raulang Co., The.....1115
Bauer Bros. Co., The.....1181
Beloit Iron Works.....1091
Betz, W. H. & L. D. 1101
Binney & Smith Co. 1179
Bird Machine Company.....
Black-Clawson Co., The.....1155
Boston Woven Hose & Rubber Co. 1121
Bowser & Co., Inc., S. F. 1171
Bowsher Co., The N. P. 1173
Buffalo Pumps, Inc. .....
Calco Chemical Div., American Cyanamid Co. 1137
Cambridge Instrument Co., Inc. 1138
Cameron Machine Co. 1183
Carthage Machine Co. 1169
Cash Company, A. W. .....
Central Machine Works.....1170
Chain Belt Company.....1143
Chemipulp Process, Inc. 1181
Chromium Corp. of America.....
Classified Advertising 1189
Cleveland Tramrail Div., The Cleveland Crane & Engineering Co. .....
Columbian Carbon Co. 1179
Cooper Alloy Foundry Co., The.....1158
Corn Products Sales Co. .....
Corning Glass Works.....1149
Covel-Hanchett Company.....1175
Cram Co., Inc., The.....1173
Darnell Corporation, Ltd. 1174
De Laval Steam Turbine Co. 1116
Dilts Machine Works.....1155
Dow Chemical Co., The.....1141
Downingtown Mfg. Co. .....4th Cover
Draper Brothers Company.....1159
du Pont de Nemours & Co., E. I. 1122
Duriron Co., Inc., The.....
Eastwood-Nealley Corporation.....
Fairbanks Company, The.....1169
Ferguson & Co., Hardy S. 1169
Fitchburg Screen Plate Co., Inc. .....
Flexible Steel Lacing Co. .....
Foxboro Company, The.....
Frederick Iron & Steel Co. .....
Fritz Publications, Inc. 1184
Garlock Packing Co., The.....
Gates Rubber Company.....1110
General Coal Co. 1098
General Electric Co. .....
Goulds Pumps, Inc. .....
Graton & Knight Company.....
Graver Tank & Mfg. Co., Inc. 1113
Greene, Tweed & Company.....1148
Gruendler Crusher & Pulverizer Co. ...
Hardy, George F. 1186
Harrington & King Perforating Co. ...1166
Harris-Seybold-Potter Co. .....2nd Cover
Hewitt Machine Co., J. W. 1175
Houghton & Co., E. F. .....
Hunt Machine Co., Rodney.....1172
Huyck & Sons, F. C. .....
Improved Paper Mach'y Corp. 1184
International Nickel Co., Inc. 1096
International Wire Works.....1160
James Mfg. Co., D. O. .....
Jewell Belt Hook Company.....1173
Johnson Corporation, The.....1186
Johnstone Engrg. & Mach. Co. 1175
Jones & Sons Company, E. D. 1114
Jones Foundry & Machine Co., W. A...
Kalamazoo Tank & Silo Co. 1173
Kalamazoo Vegetable Parchment Co...
Koppers Company .....
Langston Co., Samuel M. .....3rd Cover
Lawrence Machine & Pump Corp. 1168
Layne & Bowler, Inc. 1176
Lewellen Manufacturing Co. .....
Lindsay Wire Weaving Co., The.....1173
Link-Belt Company .....
Lockport Felt Company.....1171
Lunkenheimer Co., The.....1145
Magnus Chemical Co. .....
Mathieson Alkali Works, Inc. 1094
Mercury Manufacturing Company....
Michigan Steel Casting Co. 1171
Mixing Equipment Co., Inc. .....
Monsanto Chemical Company.....
Morey Paper Mill Supply Co. .....
Morris Machine Works.....1161
Mt. Vernon-Woodberry Mills, Inc. ....
Murray Mfg. Co., D. J. 1175
Nash Engineering Co., The.....1183
National Safety Council, Inc. 1177
Naylor Pipe Company.....
Norma-Hoffmann Bearings Corp. 1117
Norton Company .....
Norwood Engineering Co., The.....1147
Oakite Products, Inc. 1171
Ohio Injector Co., The.....
Oliver United Filters, Inc. .....
Orr Felt & Blanket Co., The.....1178
Paper & Industrial Appliances, Inc. ...
Paper Makers Chemical Dept. of Hercules Powder Company.....
Patterson Foundry & Mach. Co. ..1st Cover
Perkins & Son, Inc., B. F. .....
Philadelphia Quartz Co. .....
Pittsburgh Piping & Equipment Co. ...
Poole Foundry & Machine Co. 1186
Powell Company, The Wm. 1139
Pulp Bleaching Company.....1171
Pusey & Jones Corp., The.....1105
Reliance Electric & Engrg. Co. 1097
Research Corporation .....
Rockwood Manufacturing Co. .....
Rogers & Co., Samuel C. .....
Rollway Bearing Co., Inc. 1151
Ross Engineering Corp., J. O. .....
Ryerson & Son, Inc., Joseph T. 1177
Sandusky Foundry & Machine Co. ...
Shartle Bros. Machine Co. 1155
Shuler & Benninghofen.....1112
Simonds Saw and Steel Co. .....
Simonds Worden White Co. 1101
Smith & Winchester Mfg. Co. 1166
Solvay Sales Corporation.....
Standard Oil Co. (Indiana).....1111
Stanley Works, The.....
Stebbins Engrg. & Mfg. Co. .....
Stein, Hall & Company, Inc. 1099
Stickle Steam Specialties Co. .....
Texas Company, The.....1093
Timken Roller Bearing Co., The.....1109
Titanium Pigment Corporation.....1153
Towmotor Company 1163
Treasury Dept., U. S. A. .....
Trimbey Machine Works.....1175
Turner Halsey Company.....
Union Screen Plate Co. .....
Valley Iron Works Company.....
Vanderbilt Co., Inc., R. T. 1118
Waldron Corporation, John.....
Warren Steam Pump Co., Inc. 1164
Waterbury & Sons Co., H. 1186
Waterbury Felt Co., The.....1162
Weyerhaeuser Timber Co. .....
Williams and Co., C. K. 1169
Williams-Gray Company 1177
Worthington Pump & Machinery Corp.
Wright Manufacturing Div. of American Chain & Cable Co. 1186

Refer to the PAPER and PULP MILL CATALOGUE, at your mill office, for complete listing of all advertisers' products.

INSPECT REGULARLY!

Don't neglect your **WRIGHT HOISTS.** Make them last longer by regular and proper maintenance. Here are a few suggestions:

Put the grease gun to work! A **WRIGHT HOIST** needs thorough lubrication once a month. Keep the load chain well lubricated, too.

Don't overload your hoist. While **WRIGHTS** are famous for their ability to stand abuse, this is no time to abuse machinery. Overloading results in a stretched chain which cannot seat itself properly in sheave pockets, thus accelerating wear.

Watch the load hook. WRIGHT hooks, drop-forged from special steel, give visible warning of overloading by slowly opening. Don't continue to use hooks that have stretched.

Inspect your hoists regularly. Remember: where properly maintained, **WRIGHT HOISTS** have given continuous, trouble-free service for 20 to 25 years.

In Business for Your Safety

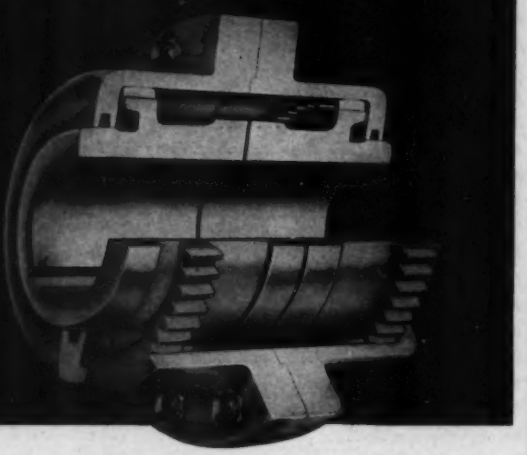
WRIGHT MANUFACTURING DIVISION

York, Pa., Chicago, San Francisco
New York

AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT, CONNECTICUT

POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

GEORGE F. HARDY

Consulting Engineer

305-309 Broadway, New York City, N. Y.

Member—Am. Soc. C. E.—Am. Soc. M. E.—Eng. Inst. Can.

Consultation—Reports—Valuations—Estimates—Paper and Pulp Mills—Hydro-Electric and Steam Power Plants—Plans and Specifications

Use This MODERN Stuffing Box

The Johnson *Rotary Pressure* Joint

Hundreds of paper mills have endorsed it. Write for details.

Product of The Johnson Corporation

845 Wood St., Three Rivers, Mich.

- Self Oiling
- Completely Packless
- Self Adjusting
- Absorbs lateral and angular misalignment
- Lengthens life of syphon drainage pipe.

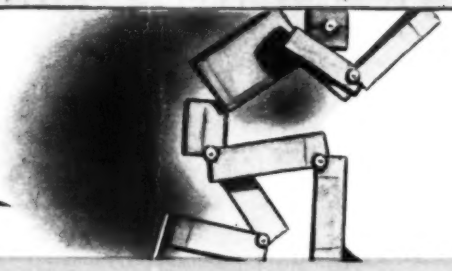
WATERBURY FELTS

are made by

H. Waterbury & Sons Co.

Oriskany, New York

PAPERBOARD CARRIES A WAR-PACK TOO!

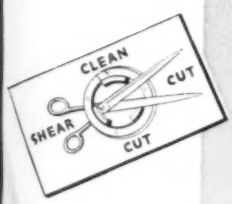


The

Paperboard Industry increasingly has labored to keep up with war demands while also supplying the civilian front. In this effort, no small part is played by the machines whose built-in stamina now shows its worth in keeping up production 24 hours a day.

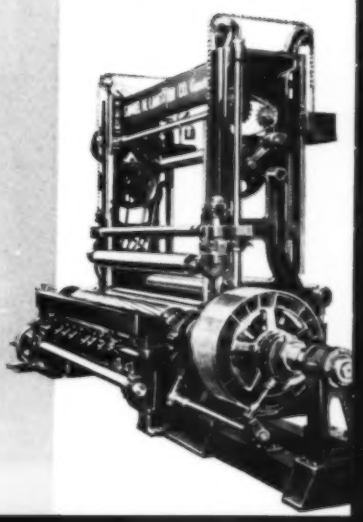
Langston always has prided itself on putting into every machine bearing its name, a bit more careful design, a more rigid standard of quality for materials used, the highest measure of workmanship. All this has resulted in Langston users getting that extra something so vital now when men and machines alike are called upon for *more* than their supposed limit of endurance.

SAMUEL M. LANGSTON COMPANY, Camden, N. J.

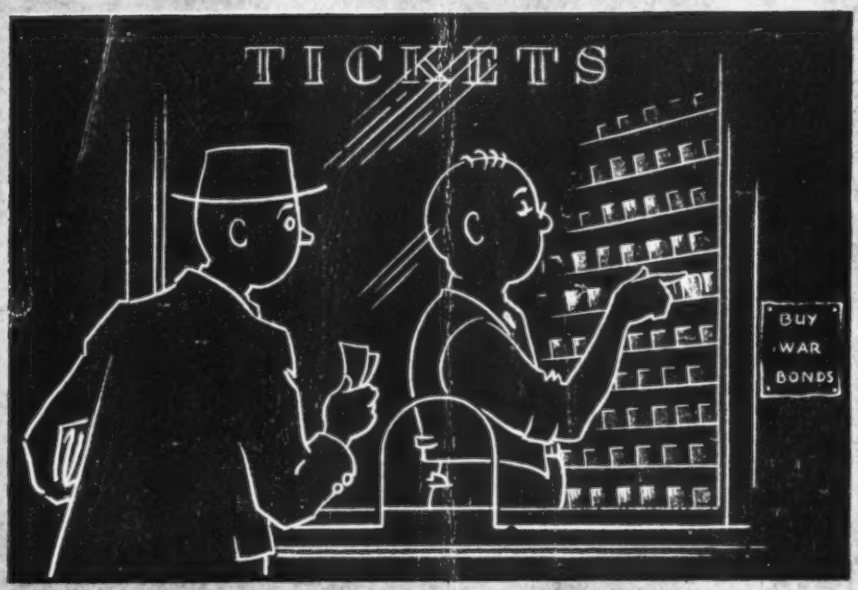


LANGSTON

SLITTERS AND ROLL WINDERS



DOWNINGTOWN



WE MAY HAVE "JUST THE TICKET" FOR YOUR REPAIR PART PROBLEM

DESPITE War Work, we may be able to help you secure the repair part you need. You see, during all the years we've been in business, we've accumulated a stock of various paper mill machinery parts. We cleaned out some for SCRAP and of what we have left, some are a bit rusted with age and exposure. But old or new, a coat of paint and some judgment will often accomplish wonders. . . . If you're up against it, send us a sketch or a description of what you need, whether it is for a machine built by us or not. If what you want isn't available, "mebbe" a substitute is here waiting. . . . We're at your service, night or day. We may have "just the ticket." . . . Downingtown Manufacturing Co., Downingtown, Pennsylvania.

DELIVERING FOR DEFENSE TODAY—DEVISING DEVELOPMENTS FOR TOMORROW